UNIVERSITY OF JAMMU

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

NOTIFICATION
(20/May /Adp/62)

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 revised Syllabi and Courses of Study in the subject of **B.A. /B.Sc. (Computer Applications)** for semesters I to VI under the **Choice Based Credit System** at the Undergraduate level for the examinations to be held in the years indicated against each semester as under:-

Subject	Semester	Course Code	For the examinations to be held in the year	% of Change
Computer Application (B.A/B.Sc.)	Semester-I	UCATC-101	Dec.2020, 2021 and 2022	**55%**
		UCAPC-150	Dec. 2020, 2021 and 2022	
	Semester-II	UCATC-201	May 2021, 2022 and 2023	**05%**
		UCAPC-250	May 2021, 2022 and 2023	
	Semester-III	UCATC-302	Dec 2021, 2022 and 2023	**100%**
		UCAPC-350	Dec. 2021, 2022 and 2023	
		UCAPS-351	Dec 2021, 2022 and 2023	**25%**
	Semester-IV	UCATC-401	May 2022, 2023 and 2024	**45%**
		UCAPC-450	May 2022, 2023 and 2024	
		UCAPS-451	May 2022, 2023 and 2024	**90%**
	Semester-V	UCAPS-551	Dec. 2022, 2023 and 2024	**80%**
		UCATE-501	Dec. 2022, 2023 and 2024	**45%**
		UCAPE-550	Dec. 2022, 2023 and 2024	
		UCATE-503	Dec.2022, 2023 and 2024	**100%**
		UCAPE-560	Dec. 2022, 2023 and 2024	
		UCATE-511	Dec. 2022, 2023 and 2024	**New Introduction**
	Semester-VI	UCAPS-652	May 2023, 2024 and 2025	**100%**
		UCATE-601	May 2023, 2024 and 2025	**15%**
		UCAPE-650	May 2023, 2024 and 2025	
		UCATE-602	May 2023, 2024 and 2025	**25%**
		UCAPE-660	May 2023, 2024 and 2025	
		UCATE-605	May 2023, 2024 and 2025	**New Introduction**

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

Sd/-
DEAN ACADEMIC AFFAIRS

No. F.Acd/II/20/61-104
Dated: 01-06-2020

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. Exam.UG)
7. Incharge University Website for necessary action please.

Sumita Sharma 29/5/2020.
Deputy Registrar (Academic)

29/5/20

DEPARTMENT OF COMPUTER SCIENCE & IT,
UNIVERSITY OF JAMMU, JAMMU

B.A/B.Sc. Computer Applications (CBCS)

COURSE WISE PERCENTAGE CHANGE IN THEORY COURSES

Semester – I

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses	UCATC-101	Computer Fundamentals and IT Tools	55%	
	UCAPC-150	Practical (Based on Office Tools)		
Skill Enhancement Course (SEC)				
Discipline Specific Elective (DSE)				

Semester – II

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses	UCATC-201	Problem Solving using C-language	5%	
	UCAPC-250	Practical (Based on UCATC-201)		
Skill Enhancement Course (SEC)				
Discipline Specific Elective (DSE)				

Semester – III

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses	UCATC-302	Object Oriented Programming Using C++	100%	Course changed
	UCAPC-350	Practical (Based on UCATC-302)		
Skill Enhancement Course (SEC)	UCAPS-351	PC Assembly and Installation	25%	
Discipline Specific Elective (DSE)				

Semester – IV

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses	UCATC-401	Database Management System and SQL	45%	
	UCAPC-450	Practical (Based on UCATC-401)		
Skill Enhancement Course (SEC)	UCAPS-451	Information Security	90%	
Elective Discipline Specific(DSE)				

Semester –V

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses				
Skill Enhancement Course (SEC)	UCAPS-551	Multimedia Computing	80%	
Discipline Specific Elective (DSE) (Any One Combination)	UCATE-501 **AND** UCAPE-550	Fundamentals of Operating System **AND** Practical (Based on UCATE-501)	45%	
	UCATE-503 **AND** UCAPE-560	Data and File Structures **AND** Practical (Based on UCATE-503)	100%	Course changed
Generic Elective	UCATE-511	Fundamentals of IT (GE)	N.A.	Newly introduced*

* To be opted by the students of other discipline.

Semester – VI

Course Type	Course Code	Course Title	Percentage change	Remarks
Core Courses				
Skill Enhancement Course (SEC)	UCAPS-652	System Analysis and Design (4 credits)	100%	Course changed
Discipline Specific Elective (DSE) (Any One Combination)	UCATE-601 **AND** UCAPE-650	Networking and Internet **AND** Practical (Based on UCATE-601)	15%	
	UCATE-602 **AND** UCAPE-660	Java Programming **AND** Practical (Based on UCATE-602)	25%	
Generic Elective	UCATE-605	Basics of Internet (GE)	N.A.	Newly introduced*

* To be opted by the students of other discipline.

B.A./B.Sc. SYLLABUS

COMPUTER APPLICATIONS

UNDER

CHOICE BASED CREDIT SYSTEM

FOR THE STUDENTS TO BE ADMITTED IN THE SESSIONS 2020-21, 2021-22, 2022-23

UNIVERSITY OF JAMMU, JAMMU

Syllabus of B.A/B.Sc. Computer Applications

(Semester System)

For the students to be admitted in the year 2020-21, 2021-22 and 2022-23.

This course shall be offered in B.A/B.Sc. programme along with other courses and combinations available for the students of B.A/B.Sc. programmes. Computer Application shall be one course along with other three courses which may be opted by the students as per the combinations offered by the University/College.

SEMESTER-WISE COURSE DISTRIBUTION

Semester – I

Course Type	Course Code	Course Title	Credits
Core Courses	UCATC-101	Computer Fundamentals and IT Tools	4
	UCAPC-150	Practical (Based on Office Tools)	2
Skill Enhancement Course (SEC)			
Discipline Specific Elective (DSE)			

Semester – II

Course Type	Course Code	Course Title	Credits
Core Courses	UCATC-201	Problem Solving using C-language	4
	UCAPC-250	Practical (Based on UCATC-201)	2
Skill Enhancement Course (SEC)			
Discipline Specific Elective (DSE)			

Semester – III

Course Type	Course Code	Course Title	Credits
Core Courses	UCATC-302	Object Oriented Programming Using C++	4
	UCAPC-350	Practical (Based on UCATC-302)	2
Skill Enhancement Course (SEC)	UCAPS-351	PC Assembly and Installation	4
Discipline Specific Elective (DSE)			

Semester – IV

Course Type	Course Code	Course Title	Credits
Core Courses	UCATC-401	Database Management System and SQL	4
	UCAPC-450	Practical (Based on UCATC-401)	2
Skill Enhancement Course (SEC)	UCAPS-451	Information Security	4
Elective Discipline Specific(DSE)			

Semester –V

Course Type	Course Code	Course Title	Credits
Core Courses			
Skill Enhancement Course (SEC)	UCAPS-551	Multimedia Computing	4
Discipline Specific Elective (DSE) (Any One Combination)	UCATE-501 **AND** UCAPE-550	Fundamentals of Operating System **AND** Practical (Based on UCATE-501)	6 (4+2)
	UCATE-503 **AND** UCAPE-560	Data and File Structures **AND** Practical (Based on UCATE-503)	
Generic Elective	UCATE-511	Fundamentals of IT (GE)	6

Semester – VI

Course Type	Course Code	Course Title	Credits
Core Courses			
Skill Enhancement Course (SEC)	UCAPS-652	System Analysis and Design (4 credits)	4
Discipline Specific Elective (DSE) (Any One Combination)	UCATE-601 **AND** UCAPE-650	Networking and Internet **AND** Practical (Based on UCATE-601)	6 (4+2)
	UCATE-602 **AND** UCAPE-660	Java Programming **AND** Practical (Based on UCATE-602)	
Generic Elective	UCATE-611	Basics of Internet (GE)	6

B.A./B.Sc.-FIRST SEMESTER

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: December 2020, 2021, 2022

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-101
COURSE TITLE: COMPUTER FUNDAMENTALS AND IT TOOLS

UNIT–I

Computer and its characteristics, applications of computer, digital and analog computer, Generation of computer, Computer Types: Mainframe computer, Super computer, Mini Computer. Memory: RAM, ROM, EEPROM, UVPROM, Units of Measurement of Storage. Hard disk drives, Floppy disk, Magnetic Tapes, Optical Disks: CD, DVD, Input and output devices: Keyboard, Mouse, Joystick, scanner, OCR, OMR, web camera, monitor, printer and its types.

UNIT–II

Software and its types (System Software, Application Software, Firmware Software's) 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), Antivirus Software, Software Piracy and its types, Preventing Software Piracy.

UNIT-III

Number System: Decimal, Binary, Octal, Hexadecimal, Conversion of one number system to another, Arithmetic Operations: Addition, Subtraction, Multiplication. Complement methods: r's and (r-1)'s complement, Fractional numbers, Conversion of fractional number.

UNIT–IV

Operating System and its types, Functions of Operating System, Windows Operating System and its features, Desktop elements: Icons, My Computer, Recycle Bin, Taskbar, Network Places, Documents, Anatomy of window: title bar, menu bar, tool bar, control buttons, scroll bars, document area and status bar. Control panel, disk formatting, defragmentation, Disk Clean-Up, magnifier, Narrator, On-Screen Keyboard.

UNIT–V

Introduction to Computer Network, Data Communication, Components of Data Communication, Data Transmission Mode, LAN, MAN, WAN, LAN Topologies: Ring, Bus, Star, Mesh and Tree Topologies, Internet, Intranet, IP Address, DNS, Web page, Website, Browsers, URL, e-mail, Applications of Internet.

SUGGESTED READINGS:

1. Pradeep K. Sinha and Priti Sinha, "Computer fundamentals", BPB publications, 2010.
2. A. Leon, A and L. Mathews, "Fundamentals of information technology", Leon Press, 1999.
3. Suresh K. Basandra, "Computers today", Galgotia publications, 2002.

B.A./B.Sc.-FIRST SEMESTER

Contd.

Total Marks= 100

No. of Credits = 4 | Internal: 20 Marks

Time allotted for Major Test= 2 ½ Hrs | Semester Exam: 80 marks

Examination to be held: December 2020, 2021, 2022

COURSE NO: UCATC-101

COURSE TITLE: COMPUTER FUNDAMENTALS AND IT TOOLS

4. Peter Norton, "Introduction to computers", Sixth Edition Tata McGraw Hill, 2007.
5. Joyce Coax, Joan Preppernau, Steve Lambert and Curtis Frye, "2007 Microsoft® Office System step by step", Microsoft Press, 2008.
6. R. K. Taxali, "PC Software for Windows", Tata McGraw Hill Publishers Pvt. Ltd.
7. V. Rajaraman, "Fundamentals of Computers", PHI.
8. Introduction to Information Technology, ITL Education Solution Ltd., Pearson Education India, 2012

Instructions for paper setter

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

Section A

Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B

Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C

It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FIRST SEMESTER

TITLE: Practical (Based on Office Tools)

Course No.	**: UCAPC-150**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: December 2020, 2021, 2022

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.- SECOND SEMESTER

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: May2021, 2022, 2023

Internal:20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-201
COURSE TITLE: PROBLEM SOLVING USING C-LANGUAGE

UNIT-I

Algorithm and its characteristics, Representation of Algorithm, Flowcharts, Flowchart Symbols, Advantages and Limitations of Flowcharts, History of C language, Structure of C program, compiling, and running a C program, Errors: syntax, run time, linker and logical errors, C-Preprocessor, Header files, File inclusion.

UNIT-II

Character Set, Keywords and Identifiers, Constants, Data Types, Variables, qualifiers, Format of C program, Arithmetic, Relational and Logical Operators, Assignment Operators, Increment and Decrement Operators, Operator Precedence and Associativity.

UNIT-III

Formatted Input and Output function, escape sequences, Simple if Statement, if... else Statement, Nesting of if...else Statements, Switch Statement, Conditional Operator, goto Statement, loops: for, while and do-while loops, break and continue statement.

UNIT-IV

Storage classes, local vs global variables, Pointers, Declaring Pointer Variables, using pointer variable, Arrays:One and Multi Dimension Arrays, Initialization of one and two dimensional Arrays, Declaring and Initializing String Variables.

UNIT-V

Preprocessor directives, Macro substitution, Symbolic Constant, Function Definition, Function Calls (call by value and call by address method) Returning Value, Types of Functions, Recursion, Mathematical and String handling functions, Defining Structure, Declaring and Accessing Structure and union Variables.

SUGGESTED READINGS:

1. B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PHI, 2000.
2. Shubhnandan S. Jamwal, "Programming in C", Pearson Publications, 2014.
3. Yashwant Kanetkar, "Let us C", BPB Publications, 2002.
4. Behrouz A. Forouzan and Richard F. Gilberg, "Computer Science :A Structured Programming Approach using C", PHI, 3rd Edition, 2007.
5. E. Balaguruswamy, "Programming in ANSI C", Tata McGraw-Hill publications.
6. Jeri R. Hanly and Elliot B. Koffman, "Problem Solving and Programming in C", Pearson, 5th Edition 2007.

B.A./B.Sc.- SECOND SEMESTER

Contd.
Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: May2021, 2022, 2023

Internal:20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-201
COURSE TITLE: PROBLEM SOLVING USING C-LANGUAGE

7. S. K Srivastava and Deepali Srivastava, "C in depth", BPB Publications.

Instructions for paper setter

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

Section A
Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.- SECOND SEMESTER

TITLE: Practical (Based on UCATC-201)

Course No.	**: UCAPC-250**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: May 2021, 2022, 2023

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.-THIRD SEMESTER

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2021, 2022, 2023

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-302
COURSE TITLE: OBJECT ORIENTED PROGRAMMING USING C++

UNIT-I

Paradigms of Programming Languages, Procedural programming, Comparison of Object Oriented and Procedure Oriented Approaches.

Concept of Object Oriented Programming–Abstraction, Data hiding, Data encapsulation, Class and Object, Polymorphism, Inheritance. Benefits of OOPs, Applications of OOPs,

Basic program constructs-Data types, reference variables, Input/output statements, comments, escape sequence, manipulators, type conversion, arithmetic, logical and relational operators; preprocessor directives, header files.

UNIT-II

Conditional statements: if-else, if-else-if ladder, nested if, switch, Nested switch, break and continue; Loops: for, while, do-while, Nested and infinite loops;

Structured Data Type: Array-Declaration / initialization of one and two dimensional array, Inputting, Accessing, Manipulation of Array elements.

Functions: Defining a function, Invoking/calling a function, passing arguments to function, inline functions, default argument, constant argument, call by value, call by reference, return statement; functions with arrays, function overloading.

UNIT-III

Implementation of OOP concepts in C++: Definition of a class, Members of a class-Data Members and Member Functions (methods), visibility modes; Member function definition: inside and outside class definition; Declaration of objects; accessing members from object(s), Objects as function arguments - pass by value and pass by reference; static members; Array of objects.

UNIT-IV

Constructors and types: Declaration/definition; default, copy and parameterized constructors; Memory management; overloaded constructors; Destructors.

String- Declaration/Initialization, Array of Strings, String manipulations, sprintf() function, String Handling and Mathematical functions.

UNIT–V

Pointers: Declaration/Initialization; Dynamic memory allocation/de-allocation operators: new, delete; this pointer; Inheritance: base class and derived class, types of inheritance: single level, multiple, multilevel, hierarchical, hybrid inheritance, derived class constructors, Private derived, public derived and protected derived class, accessibility of members from objects, Exception handling.

B.A./B.Sc.-THIRD SEMESTER

Contd.
Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2021, 2022, 2023

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-302
COURSE TITLE: OBJECT ORIENTED PROGRAMMING USING C++

SUGGESTED READINGS:

1. E. Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw-Hill, 4th Edition, 2008.
2. Herbert Schildt, "C++ The Complete Reference", McGraw Hill, 4th Edition, 2002.
3. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications, 3rd Edition, 2003.
4. Harvey M. Deitel and Paul J. Deitel, "C++: How to Program", Prentice Hall, 2006.
5. Bjarne Stroustrup, "The C++ Programming Language", Addision Wesley, 2000.

Instructions for paper setter

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

Section A
Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-THIRD SEMESTER

TITLE:Practical (Based on UCATC-302)

Course No.	**: UCAPC-350**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: December 2021, 2022, 2023

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.-THIRD SEMESTER

SKILL ENHANCEMENT COURSE

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: December 2021, 2022, 2023

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-351
COURSE TITLE:PC ASSEMBLY AND INSTALLATION

UNIT-I

Input and Output Devices, Cables, Connectors, Jumpers, Computer Ports, Different types of Motherboard, SMPS, UPS (Online/Offline), Controller Cards: Display Cards, Sound Card, AGP Cards, TV Tuner Cards, LAN Cards, Ethernet Cards, Different types of RAM used in PC's, Replacement of components.

UNIT-II

Performing installation, configuration, and upgrading of microcomputer/ computer: Hardware and Software requirement, Assembling the system, POST (Power on Self Test), BIOS setting, BIOS Password break, Formatting/Partitioning of Hard Disk, Installation of Operating System, Multi-Booting, Creating bootable media.

UNIT-III

Maintenance: Windows file repairing, Use of system tools like Disk defragmentation, Disk Clean Up, Scan disk etc., use of open source data recovery tools, CD/ Pen Drive booting. Approaches to solve a PC problem, troubleshooting a failed boot before the OS is loaded, different approaches to installing and supporting I/O device, managing faulty components.

UNIT-IV

Different types of Application Software, Application Software Installation, Antivirus Software Installation, Installation of Printers: local printers, Network Printers, Scanners, Web Camera, working with different control panel option of Windows, using system restore features, backup and restore.

UNIT-V

Basic LAN concepts, IP Address, ping, ipconfig, network cabling, network cable connectors, cabling tools, network troubleshooting, modems: Installation and configuration of different type of Modems, setting up broad band connection, administrative modem settings: creating different Wi-Fi network, securing modem using wifi key, admin password, MAC/IP filter, Sharing Internet Connection.

SUGGESTED READINGS:

1. P. K. Sinha and Priti Sinha, "Computer Fundamentals", BPB Publications.
2. R. K. Taxali, "PC Software for Windows Made Simple", Tata McGraw Hill.
3. Wikibooks contributors, "How to Assemble a Desktop PC", Platypus Global Media.
4. Jacob Beckerman, "How to build a computer, A step by step guide", Kindle Edition.

B.A./B.Sc.-THIRD SEMESTER

Contd.

SKILL ENHANCEMENT COURSE

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: December 2021, 2022, 2023

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-351
COURSE TITLE:PC ASSEMBLY AND INSTALLATION

5. Mark L. Chambers, "Build your own PC Do-It-yourself for dummies".
6. N.S. Reddy, "PC Hardware - Theory and Practical, In Depth step by step", Neopublishing house.

Instructions for paper setter

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

Section A
Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FOURTH SEMESTER

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATC-401
COURSE TITLE: DATABASE MANAGEMENT SYSTEM AND SQL

UNIT-I

Introduction to Data, Field, Record, File, Database, Advantages and Disadvantages of Traditional File Approach, Database Management System: Concepts, Need of Database Management System, Components of DBMS, Data Independence, Three level architectural of Database, Centralized and Client Server Architecture for DBMS, Advantages and Disadvantages of Database Management System, DBMS Vs RDBMS.

UNIT–II

Data Model and Types of Data Model, Relational Data Model, Hierarchical Model, Network Data Model, Object/Relational Model, Object-Oriented Model; Entity-Relationship Model, Modeling using E-R Diagrams, Notation used in E-R Model, Relationships and Relationship Types. Conversion of ER diagrams to Relational Database Design.

UNIT–III

Database Management System Structure, Database Manager, Database Administrator, and Data Dictionary; Distributed Processing. Relational Data Model: Relational data models, Relational algebra. Normalization: Functional Dependency; Anomalies in a Database; Properties of Normalized Relations; First Normalization; Second Normal Form Relation; Third Normal Form; Boyce-Codd Normal Form (BCNF); Fourth and Fifth Normal Form.

UNIT–IV

Concurrency Control: Database anomalies, ACID rules, Transaction processing, Deadlocks, Concurrency control, Major goals of Concurrency, Methods of Concurrency control and its types, Locking Techniques, Timestamp ordering, Recovery Management, Recovery Techniques.
SQL: Categories of SQL Commands; Data Definition Language, Data Manipulation Language, Query processing, Data types, Operators, Expressions, Create Database, DROP database.

UNIT-V

SQL: Create table; Alter, Update and Delete query, Select statement, inserting values, Constraints, WHERE clause, AND,OR, NOT operators, LIKE clause, TOP Clause, HAVING clause, ORDER and GROUP-BY clause, wild cards, Joins, DISTINCT keyword, DATE functions and other Inbuilt functions, Views.

B.A./B.Sc.-FOURTH SEMESTER

Contd.

Total Marks = 100

No. of Credits = 4 | Internal: 20 Marks

Time allotted for Major Test = 2 ½ Hrs | Semester Exam: 80 marks

Examination to be held: May 2022, 2023, 2024

COURSE NO: UCATC-401

COURSE TITLE: DATABASE MANAGEMENT SYSTEM AND SQL

SUGGESTED READINGS:

1. Bayross, Ivan, "SQL, PL/SQL: The programming language of Oracle", BPB publications, 2009.
2. Bipin Desai, "An Introduction to Database Systems", Galgotia Publications Pvt. Ltd.
3. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, "Database System Concept", McGraw-Hill, 7th Edition, 2020.
4. Ramon Mata-Toledo and Pauline Cushman, "Schaum's Outline of Fundamentals of Relational Databases (Schaum's Outline Series) Toledo", McGraw-Hill Education, 2000.
5. Scott Urman, Ron Hardman and Michael McLaughlin, "Oracle Database 10g PL/SQL Programming", Tata McGraw-Hill, 8th Edition, 2008.

Instructions for paper setter

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

Section A

Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B

Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C

It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FOURTH SEMESTER

TITLE: Practical (Based on UCATC-401)

Course No.	**: UCAPC-450**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: May 2022, 2023, 2024

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.-FOURTHSEMESTER

SKILL ENCHANCEMENT COURSE

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: May 2022, 2023,2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-451
COURSE TITLE: INFORMATION SECURITY

UNIT-I

Need for security, principles of security – confidentiality, integrity and authentication, Computer Security Concepts (CIA), Security Threats/Attacks, Vulnerabilities and protections, Types of Threats- DoS, DDoS, Spoofing, virus, worms, Trojans, Backdoor, phishing, and spam, Information Security, Methods of Protection.

UNIT - II

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, Transposition Techniques – Rail Fence Technique, Simple Columnar Transposition and Vernam Cipher, Types of Encryption Systems, Cryptanalysis, Symmetric and asymmetric cryptography, Authentication, Password-Based, Address-Based and Certificate-Based Authentication, Hashing.

UNIT - III

Diffie-Hellman key-exchange algorithm with examples, problems with the algorithm: Man –in-the-Middle Attack, secret key, Characteristics of Public Key System, Asymmetric key encryption and decryption, RSA Algorithm, security of RSA,
Symmetric Key Encryption: Data Encryption Standard (DES) algorithm, Basic principles and working of the algorithm, Security of the DES.

UNIT - IV

Introduction TCP/IP, Network security issues, Sniffing, E-Mail security- IMAP and Pop3, Intruders, Firewalls-need and features of firewall, network address translation, Types of firewall, demilitarised zone (DMZ), Intrusion Detection Systems, Virtual Private Networks.

UNIT – V

Cyber Crime and cyber security, Tools and Methods Used in Cybercrime, Short notes on Computer Forensics, Digital Forensics, OS fingerprinting, TCP/IP stack masking, Ethical hacking and Social Engineering.

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.

B.A./B.Sc.-FOURTHSEMESTER

Contd.

SKILL ENCHANCEMENT COURSE

Total Marks= 100
No. of Credits = 4
Time allotted for Major Test= 2 ½ Hrs
Examination to be held: May 2022, 2023,2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-451
COURSE TITLE: INFORMATION SECURITY

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.

Instructions for paper setter

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

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(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FIFTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-501
COURSE TITLE:FUNDAMENTALS OF OPERATING SYSTEM

UNIT-I

Basic of Operating System: Definition, Generations of Operating Systems, types of operating systems. Services of Operating System, OS Structure: Layered, Monolithic, Microkernel, System Calls, System Programs and System Boot. Introduction to Linux/Unix, Windows, Android, Concept of Virtual Machine.

UNIT–II

Process Management: Definition, Process Relationship, 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.

UNIT-III

Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance, Deadlock detection and Recovery. Logical and Physical Memory, Contiguous Memory allocation – Fixed and variable partition – Internal and External fragmentation, Paging, Basics of Virtual Memory, Demand Paging, Replacement policies: First in First Out (FIFO), Not recently used (NRU) and Least Recently used (LRU), Optimal (OPT).

UNIT–IV

File System and Management: File concept, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table), efficiency and performance.

UNIT–V

The Linux/Unix Environment, The login prompt, General features of Linux/Unix, commands/ command structure. Command arguments and options. Understanding of some basic commands such as cd, cp, mv, rm, mkdir, more, less, cat, grep, find, banner, cut, ws, echo, ls, kill, ps, sort, banner, who, date, passwd, cal, sleep etc. Combining commands, redirections, pipes, filters, Linux/Unix Administration, The root login. Becoming the super user: su command. The /etc/passwd and /etc/shadow files. Commands to add, modify and delete users.

SUGGESTED READINGS:

1. Abraham Silberschartz, Peter Baer Galvin and Greg Gagne, "Operating system Principles", WSE wiley, 2006.

B.A./B.Sc.-FIFTH SEMESTER

Contd.

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-501
COURSE TITLE:FUNDAMENTALS OF OPERATING SYSTEM

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.
5. Milenkovic M, "Operating system-concepts and design", McGraw Hill.

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Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FIFTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-503
COURSE TITLE: DATA AND FILE STRUCTURES

UNIT–I

Introduction and Classification of Data Structures, Data Structure Operations, Time and Space Complexity of Algorithms.

Arrays-linear and 2D array -Sequential allocation and address calculation, Traversal, Insertion, deletion of an element from an array.

UNIT–II

Introduction of Pointer, Dynamic Memory Allocation, Self-Referential Structures, Linked Lists-Representation of linked list in memory, Memory allocation and Garbage Collection, overflow and under flow, Traversing a Singly linked list, insertion into singly linked list, Deletion from singly linked list.

Applications of Linked List: Representation of Sparse Arrays, Sparse Matrices and Polynomials.

UNIT–III

Stack: Introduction to stack, Implementation. Operations on stack (PUSH and POP) and its Implementation, Applications of Stack: Converting expressions from INFIX to POSTFIX notation and evaluation of Postfix expression;

Queue: Introduction to Queue, Implementation, Operations on Queue (Insert and Delete), Applications of Queue.

UNIT–IV

Sorting: Bubble Sort, Insertion Sort, Selection Sort.

Searching: Linear Search and Binary Search, Time and Space Complexity of Sorting and Search Algorithms.

UNIT–V

File Structures: Concepts of Fields, Records and Files, Files: File Organization, Sequential Files, Structure, Operations, Disadvantages, Direct File Organization, Indexed Sequential File Organization, Hashing Techniques for Direct Files.

SUGGESTED READINGS:

1. G. A. V. Pai, "Data Structures and Algorithms: Concepts, Techniques and Applications", Tata McGraw-Hill, July 2017.
2. Vishal Goyal, "A Simplified Approach to Data Structures", Shroff Publishers Pvt. Ltd, 2014.
3. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, "Fundamentals of Data Structures in C", Universities Press, 2nd Edition 2008.

B.A./B.Sc.-FIFTH SEMESTER

Contd.

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-503
COURSE TITLE: DATA AND FILE STRUCTURES

4. J. P. Tremblay and P. G. Sorenson, "Introduction to Data Structures with Applications", TMH, 2007.
5. Seymour Lipschutz, "Theory and Problems of Data Structures", Sehaum's Outline Series in Computers Tata McGraw-Hill, 2006.
6. A. M. Tannenbaum and M. J. Augenstein and Y. Langsam, "Data Structures with C", PHI, 2006.

Instructions for paper setter

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

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(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-FIFTH SEMESTER

GENERIC ELECTIVE

Total Marks = 100
No. of Credits = 6
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-511

COURSE TITLE: FUNDAMENTALS OF IT (GE)

UNIT-I

Computer and its characteristics, application of computers, digital and analog computer, Generation of computers, Computer Types: Super computer, Mainframe computer, Mini Computer, Microcomputer, Central Processing Unit and its parts, Input and output devices: keyboard, mouse, joystick, scanner, OCR, OMR, Barcode reader, Web camera, Monitor, Printer and its types.

UNIT-II

Storage and Memory concepts: RAM, ROM, PROM, UVPROM, EEPROM, Cache Memory, Secondary storage devices (Floppy disk, Hard disk, Magnetic tapes), Concept of Track, Sector, Cylinder, Spindle, Platter, Seek Time, Response Time, Latency, Turn-around Time, Optical Disks.

UNIT–III

Software and its types (System Software, Application Software, Firmware Software) Computer Languages and its types (Machine Language, Assembly Language, High Level Language: advantages and disadvantages of computer languages), Translators: Compiler, Linker, Interpreter, Computer virus and its types (Trojan, malware, spyware), Antivirus software, Software Piracy and its types, Preventing Software Piracy.

UNIT-IV

Operating system and its functions, types of operating system (Single user, multi-user, multitasking, time sharing, distributed).Windows Operating System and its features, Desktop elements: Icons, My Computer, Recycle Bin, Taskbar, Network Places, Documents, Anatomy of window: title bar, menu bar, tool bar, control buttons, scroll bars, document area and status bar. Control panel, disk formatting, defragmentation, Disk Clean-Up, magnifier, Narrator, On-Screen Keyboard.

UNIT-V

Computer Networks: Introduction to computer network, data communication, components of data communication, data transmission mode, LAN, MAN, WAN, LAN Topologies: Ring, Bus, Star, Mesh and Tree topologies, Internet, Intranet, IP Address, IP Classes, DNS, Web page, Website, Browsers, URL, Applications of Internet, Services of Internet, E-mail, FTP, Remote Login, IRC, Newsgroups, Mailing Lists.

SUGGESTED READINGS:

1. Pradeep K. Sinha and Priti Sinha, "Computer fundamentals", BPB publications, 2010.
2. A. Leon, A and L. Mathews, "Fundamentals of information technology", Leon Press, 1999.

B.A./B.Sc.-FIFTH SEMESTER

Contd.

GENERIC ELECTIVE

Total Marks = 100
No. of Credits = 6
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-511

COURSE TITLE: FUNDAMENTALS OF IT (GE)

3. Suresh K. Basandra, "Computers today", Galgotia publications, 2002.
4. Peter Norton, "Introduction to computers", Sixth Edition Tata McGraw-Hill, 2007.
5. V. Rajaraman, "Fundamentals of Computer", EEE.
6. Introduction to Information Technology, ITL Education Solution Ltd., Pearson Education India, 2012

Instructions for paper setter

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

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(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

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B.A./B.Sc.-FIFTH SEMESTER

TITLE: Practical (Based on UCATE-501)

Course No.	**: UCAPE-550**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: December 2022, 2023, 2024

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.-FIFTH SEMESTER

TITLE: Practical (Based on UCATE-503)

Course No.	**: UCAPE-560**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: December 2022, 2023, 2024

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

-X-

B.A./B.Sc.-FIFTH SEMESTER

SKILL ENHANCEMENT COURSE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal :20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-551
COURSE TITLE: MULTIMEDIA COMPUTING

UNIT-I

Introduction to Multimedia, Multimedia Definition and Concepts, Need of Multimedia, Areas of use, Development platforms for multimedia, Identifying Multimedia elements-Text, Images, sound, Animation and video, Multimedia Hardware and Software requirement, Making simple Multimedia with Power Point text as a component of Multimedia.

UNIT-II

Sound in multimedia, Importance of sound in multimedia, sound and its attributes- tone, intensity, frequency, wavelength, pitch. Mono v/s stereo sound, Analog vs Digital sounds, Concept of MIDI: Musical Instrument Digital Interface.

UNIT-III

Graphics in Multimedia, Importance of graphics in Multimedia, Various attributes of Images- Size, color, Bit Depth, Resolution, Various Image file formats BMP, DIB, EPS, PIC and TIF format their features and limitations.

UNIT-IV

Video and animation in multimedia, impact of video in multimedia, Basics of video, analog and digital video, Brief note on various video standards PAL, NTSC. Basics of animations, types of animation and use of animation.

UNIT-V

Application of Multimedia and its feature, Application of multimedia in Education, Entertainment, Journalism etc. Future of Multimedia, career in Multimedia Production, Virtual reality as new technology in Multimedia, Application of Virtual Reality.

SUGGESTED READINGS:

1. Tay Vaughan, "Multimedia Making It work" Tata McGraw Hill.
2. Ze-Nian Li and M. S. Drew, "Fundamental of Multimedia", Pearson Education.
3. D. J. Gibbs and D. C. Tsichritzs, "Multimedia programming Object Environment and Frame work", 2000.

B.A./B.Sc.-FIFTH SEMESTER

Contd.

SKILL ENHANCEMENT COURSE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: December 2022, 2023, 2024

Internal :20 Marks
Semester Exam: 80 marks

COURSE NO: UCAPS-551
COURSE TITLE: MULTIMEDIA COMPUTING

Instructions for paper setter

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

Section A
Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

-X-

B.A./B.Sc.-SIXTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-601
COURSE TITLE: NETWORKING AND INTERNET

UNIT–I

Networking definition, Network hardware and software, Types of networks- Based on transmission technology (Simplex, Duplex), Based on their scale (LAN, WAN, MAN and wireless networks), Advantages of Networking, Topologies, Transmission Medium, Components (Hub, Connector, Switch, Router, Gateway, Bridge).

UNIT–II

Protocol, Client and Server, Internet Protocol, IP Addresses, Classful and Classless Addressing Classes of IP Addresses, Intranet and Internet (Advantages and Disadvantages), OSI Reference Model, TCP/IP Reference Model, peer to peer network, Comparison of the OSI and the TCP/IP Reference Models, Design issues for the layers, Merits and De-merits of Layered Architecture, Network standardization and network security.

UNIT–III

World Wide Web, Web Browser, Web Portal, Web Server, Web Site/Web Page, HTTP, Domain Name System, Uniform Resource Locator, Internet Service Provider, Web applications, Search Engine.

UNIT–IV

Introduction to HTML, Structure of HTML Program, Formatting Tags, Image Tags, Linking of Documents, Lists, Tables, Frames, Iframe, HTML Forms, Introduction to Cascading Style sheet, Defining Style, Inline Styles, Internal and External Style sheet.

UNIT-V

Introduction to JavaScript, Data types Variables, Conditional and Loops Control Statement, Functions, Arrays, Events, Strings and Mathematical Functions, Window and Document Object and Basic Events.

SUGGESTED READINGS:

1. Andrew. S. Tannenbaum,"Computer Network", Pearson, 1996.
2. Williams Stallings,"Data and Computer Communication", Pearson, 1988.
3. Behrouz A. Forouzan,"Data Communication and Networking", McGraw Hill Professional Publication, 5th Edition, 2013.
4. Douglas E. Comer, "The Internet Book", Prentice Hall, 4th Edition, 2007.
5. Eric Roberts, "Introduction to JavaScript Programming The 'Nothing but a Browser' Approach", Pearson, 2020.
6. Phil Ballard, "JavaScript in 24 Hours, Sams Teach Yourself", Pearson, 7th Edition, 2019.

B.A./B.Sc.-SIXTH SEMESTER

Contd.

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-601
COURSE TITLE: NETWORKING AND INTERNET

7. Felke-Morris and Felke-Morris, "Basics of Web Design: HTML5 and CSS", Pearson 5th Edition, 2020.
8. Julie C. Meloni and Jennifer Kyrnin, "HTML, CSS, and JavaScript All in One, Sams Teach Yourself", Pearson, 3rd Edition, 2019.

Instructions for paper setter

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

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(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

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B.A./B.Sc.-SIXTH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal :20 marks
Semester Exam: 80 marks

COURSE NO: UCATE-602
COURSE TITLE: JAVA PROGRAMMING

UNIT-I

Introduction to Java, Java Runtime Environment, Java Virtual Machine, Features of java programming, Java Buzzwords, Garbage Collection, Java Keywords, Data Type and Variables, Java Identifiers, Java Operators, Expressions, Control Statements, Loops and Arrays.

UNIT-II

Class and Objects, Object Oriented concepts, Application of object oriented programming Constructors, Method Overloading, Static methods, Inheritance, Access Modifiers, Method Overriding, Abstract Classes, Polymorphism, Packages, Interfaces.

UNIT-III

Fundamentals of Exceptions Handling, Types of Exceptions, try-throw-catch construct, nested try block, throw, throws, finally keywords, Writing Exception Subclasses, Introduction to Multithreading, using isAlive() and join(),Priorities of Threads, Stopping of Threads.

UNIT-IV

I/O in Java, Byte Stream Classes, Character Stream Classes, Reading and Writing Files, Serialization, The Transient and Volatile Modifiers, The String and String Buffer Class, String Methods, String Processing, Escape Characters.

UNIT-V

Applet fundamentals, Applet architecture, Applet Life Cycle, Event Handling:- Mouse and Keyboard Events, Applet Tags, Graphics and User Interfaces, Basics of AWT, Building User Interface with AWT, Layouts, Layout Manager, Action listener interface, panels, using buttons, checkbox, choice lists, lists, scroll bar, text fields, text area.

SUGGESTED READINGS:

1. Herbert Schildt, "Java2 The Complete Reference", Tata McGraw Hill, 2000.
2. E. Balagurusamy, "Programming with JAVA", Tata McGraw Hill, 3rd Edition, 2006.
3. Steven Holzner, "Java2 Black Book", Dreamtech Press, 2006.
4. Dietel and Dietel, "Java How to Program", Pearson Education, 10th Edition, 2015.
5. Grant Palmer, "Java Programmer's Reference", Wrox Press, 2000.
6. Shubhnandan S. Jamwal, "Java 9 for students", Shroff Publications, 1st Edition, 2018.
7. Daniel Liang, "Intro to Java Programming", Pearson, 10th Edition, 2015.

B.A./B.Sc.-SIXTH SEMESTER

Contd.

DISCIPLINE SPECIFIC ELECTIVE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal :20 marks
Semester Exam: 80 marks

COURSE NO: UCATE-602
COURSE TITLE: JAVA PROGRAMMING

Instructions for paper setter

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

Section A
Total of 5 short answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 80 words. Each question shall be of 3 marks.

(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

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B.A./B.Sc.-SIXTH SEMESTER

GENERIC ELECTIVE

Total Marks = 100
No. of Credits = 6
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-611
COURSE TITLE: BASICS OF INTERNET(GE)

UNIT-I

Introduction to Internet, History of Internet, Applications of Internet, Connecting to Internet, Basics of internet connectivity related troubleshooting, Services of Internet, Remote Login, IRC, FTP, Archie, IRC, Newsgroups, Mailing Lists, Search Engines, Understanding URL, Named Address.

UNIT–II

Downloading and uploading, blogs, E-Mails: Email Address, Sending Emails, Sending Attachments and Replying to Emails, Forwarding Emails, Protocols, Email Protocols: SMTP (Simple Mail Transfer Protocol), POP3 (Post Office Protocol Version 3), IMAP (Internet Message Access Protocol)
E-Mail Security: PGP (Pretty Good Privacy), PEM (Privacy Enhanced Mail), S/MIME (Secure/Multipurpose Internet Mail Extensions).

UNIT-III

Internet Addressing: IPv4 Addresses: Address Space, Notations, Classful and Classless Addressing, Subnetting, Subnet Mask, Network Address Translation (NAT), Gateway, Domain Name System, Proxy Server, DHCP Server, IPv6 addresses: Structure, Address Space. Comparison of IPv4 and IPv6.

UNIT-IV

Web Browser, Web Portal, Web Server, Web Site/Web Page, World Wide Web, HTTP, HTTPS, Uniform Resource Locator, Internet Service Provider, Web Security, Cookies, Firewalls, Web Applications.

UNIT-V

Introduction to HTML, Structure of HTML Program, Formatting Tags, Image Tags, Linking of Documents, List Tag, Tables Tag, Frames, Iframes, HTML Forms, Introduction to Cascading Style sheet, Defining Style, Inline Styles, Internal and External Style sheet.

SUGGESTED READINGS:

1. Andrew. S. Tannenbaum, "Computer Networks", Pearson.
2. Williams Stallings, "Data and Computer Communication", Pearson.
3. Forouzan, "Data Communication and Networking", McGraw Hill Professional Publication.
4. Douglas E. Comer, "The Internet Book", Prentice Hall.
5. Harley Hahn, "The Internet Complete Reference", TATA McGraw Hill.

B.A./B.Sc.-SIXTH SEMESTER

Contd.

GENERIC ELECTIVE

Total Marks = 100
No. of Credits = 6
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal: 20 Marks
Semester Exam: 80 marks

COURSE NO: UCATE-611
COURSE TITLE: BASICS OF INTERNET(GE)

Instructions for paper setter

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

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(5 x 3 = 15 marks)

Section B
Total of 5 medium answer questions (one from each Unit) shall be set and the candidates are required to answer all questions. Answer to a question should not exceed 300 words. Each question shall be of 7 marks.

(5 x 7 = 35 marks)

Section C
It will contain five long answer questions (one from each Unit). The candidates will be required to answer any two questions. Answer to each question should not exceed 600 words. Each question shall be of 15 marks.

(2 x 15 = 30 marks)

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

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B.A./B.Sc.-SIXTH SEMESTER

TITLE: Practical (Based on UCATE-601)

Course No.	**: UCAPE-650**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: May 2023, 2024, 2025

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

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B.A./B.Sc.-SIXTH SEMESTER

TITLE: Practical (Based on UCATE-602)

Course No.	**: UCAPE-660**	Duration of Examination	: 3 Hrs
No. of Credits	= 2	Total Marks	= 50

Examination to be held: May 2023, 2024, 2025

In this course the students shall be exposed to various practical problems based on the above topic and the Teacher-in-Charge shall design 20-30 problems. The students shall be required to systematically work out the solution of those problems and implement in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation test for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on written test, viva-voce, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:

External Examination = 25 marks

- Written Test = 20 marks
- Viva Voce = 5 marks

Internal Examination= 25 marks

- Written Test = 10 marks
- Viva Voce = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

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B.A./B.Sc.-SIXTH SEMESTER

SKILL ENHANCEMENT COURSE

Total Marks = 100
No. of Credits = 4 — Internal: 20 Marks
Time allotted for Major Test = 2 ½ Hrs — Semester Exam:80 marks
Examination to be held: May 2023, 2024, 2025

COURSE NO: UCAPS-652
COURSE TITLE: SYSTEM ANALYSIS AND DESIGN

UNIT-I

Software systems Analysis and Design Life Cycle: Requirement Determination, Feasibility Analysis, Final Specifications, Software System Design, Software System Implementation, Software System Evaluation, Software System Modification, Role of Software System Analyst, Tools used in Software System Analysis. Introduction to Software Engineering, Software Engineering Paradigms, Software Prototyping and Specification.

UNIT-II

Information Gathering and Feasibility Analysis: Software System Requirements Specification, Strategies, Methods, Case Study, Classification of Requirements as Strategic, Tactical, Operational and Statutory, Deciding Project Goals, Examining Alternative Solutions, Technical and Economic Feasibility, Cost Benefit Analysis.

Tools for system analysts: Data Flow Diagrams, Case Study for use of DFD, Data Dictionaries, Process Organization and Interaction, Leveling of DFDs, Software Tools to Create DFDs.

UNIT–III

Structured Software System Analysis and Design: Procedure Specifications in Structured English, Examples and Cases, Decision Table for Complex Logical Specifications, Differences between Specification-Oriented Design and Procedure Oriented.

Data Oriented Software Systems Design: Entity Relationship Model, ER Diagram, Relationships, Cardinality and Participation, Data Base Design, Architectural Design, Effective Modular Design, Procedural Design, Interface Design, HCI Design.

UNIT-IV

Software Cost Estimation Techniques: Different types of Project Metrics, Models for cost estimation (COCOMO, Putnam's function point), Project Schedules, Project and Activities, Scheduling Activities, Schedule Development Methods (Critical Path Method, Critical Chain Scheduling, PERT).

UNIT-V

Data Input Methods and Software Testing: 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.

Software Testing: Testing Issues, Testing Object-Oriented Systems. Testing Techniques: White Box Testing, Black-Box Testing. Testing Strategies: Unit Testing, Integration and Validation Testing, System Testing.

B.A./B.Sc.-SIXTH SEMESTER

Contd.

SKILL ENHANCEMENT COURSE

Total Marks = 100
No. of Credits = 4
Time allotted for Major Test = 2 ½ Hrs
Examination to be held: May 2023, 2024, 2025

Internal: 20 Marks
Semester Exam:80 marks

COURSE NO: UCAPS-652
COURSE TITLE: SYSTEM ANALYSIS AND DESIGN

SUGGESTED READINGS:

1. Roger S. Pressman, "Software Engineering", Tata McGraw Hill, 7th Edition, 2010.
2. Bob Hughes and Mike Cotterell, "Software Project Management", Tata McGraw Hill, 2011.
3. Shashikant A. Kelkar, "Software Project Management: A Concise Study", PHI Learning Pvt. Ltd., 2012.
4. Kathey and Schwalbe, "Information Technology Project Management", Thomson Learning, 2015.
5. Pankaj Jalote, "An Integrated Approach to software Engineering", PHI, 2012.

Instructions for paper setter

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(2 x 15 = 30 marks)

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

-X-