

# UNIVERSITY OF JAMMU, JAMMU

## Syllabus of B.A./B.Sc. Computer Applications (Semester System)

**For the semester examinations to be held in the year 2017 onwards.**

This course shall be offered in BA/BSc programme alongwith 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 of Computer Application is given as:-**

### Semester – I

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE)
Course code	Course Title	Course code	Course name	
UCATC-101	Computer Fundamentals and IT tools (4 credits)			
UCAPC-150	Practicals based on DOS, WINDOWS, MS-OFFICE (2 credits)			

### Semester – II

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE)
Course code	Course Title	Course code	Course name	
UCATC-201	Problem Solving using C language (4 credits)			
UCAPC-250	Practicals based on C-Language (2 credits)			

**Semester – III**

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE)
Course code	Course Title	Course code	Course name	
UCATC-301	Data and file structure using C language (4 credits)	UCAPS-351	PC Assembly And Installation (4 credits)	
UCAPC-350	Practicals (Based on Data & File Structure Using C.) (2 credits)			

**Semester – IV**

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE)
Course code	Course Title	Course code	Course name	
UCATC-401	Database Management System & SQL (4 credits)	UCAPS-451	Information Security (4 credits)	
UCAPC-450	Practical (Oracle & PL/SQL) (2 credits)			

**Semester –V**

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE) (Any One)	
Course code	Course Title	Course code	Course name	Course code	Course name
		UCAPS-551	Multimedia Computing (4 credits)	UCATE-501 & UCAPE-550	Fundamentals of Operating System (4 credits) Practical (Unix/Linux) (2 credits)
				UCATE-502 & UCAPE-560	Object Oriented Programming Using C++ (4 credits) Practical (C++) (2 credits)

**Semester – VI**

Core Courses		Skill Enhancement Course (SEC)		Elective Discipline Specific(DSE) (Any One)	
Course code	Course Title	Course code	Course name	Course code	Course name
		UCAPS-651	Website Development Tools (4 credits)	UCATE-601 & UCAPE-650	Networking and Internet (4 credits) Practical (HTML,JavaScript) (2 credits)
				UCATE-602 & UCAPE-660	Java Programming (4 credits) Practical (Java) (2 credits)

**DETAILED SYLLABUS**  
**(SEMESTER – I)**  
**(Examination to be held in Dec 2017, 2018 and 2019)**

**Course No.: UCATC-101**                      Duration of the Examination: 2 ½ Hrs

**TITLE:            COMPUTER FUNDAMENTALS AND IT TOOLS.**

No. of Credits        = 4

Total Marks            = 100

Semester Exam.      = 80

Int. Assessment      = 20

**Unit – I**

Computer and its characteristics, application of computers, digital and analog computer, Generation of computers, Storage devices: primary storage devices (RAM,ROM,PROM,EPROM,EEPROM) , secondary storage devices(Floppy disk, Hard disk, optical disk, magnetic tapes), Input and output devices (keyboard, mouse, light pen, joystick, scanner, monitor, printers,etc.)

**Unit - II**

Software and its types (System Software, Application Software, Firmware Softwares) Computer Languages and its types (Machine Language, Assembly Language, High Level Language: advantages and disadvantages of computer languages), Translators: Compiler, Linker, Interpreter.

**Unit-III**

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

Number system and its types, conversion from one base to another and vice versa, arithmetic operations, r's, (r - 1)'s complement methods.

**Unit – IV**

Operating system and its functions, types of operating system (Single user, multi-user, multitasking, time sharing, distributed). Fundamental of DOS, internal and external commands. Windows fundamentals: Anatomy of windows, desktop elements, managing files and folders, installing softwares

## Unit – V

Word Processor and its features, Editing of Text, Find and Replace, Bullets and Numbering, Spell Checker, Grammar Checker, Auto Correct, Auto Complete, Auto Text, Header and footer, tables, mail merge, border and shading, page setup, printing.

Spread sheet and its features, Entering Information in Worksheet, Editing Cell Entry, Moving and Copying Data, deleting or Inserting Cells, Rows and Columns, Custom Numeric Formats, Using Formulas and functions, Creating charts.

Presentation Softwares and its uses, steps for creating PowerPoint Presentation, PowerPoint Views, Assigning Slide Transitions, Using Preset Animations, Hiding Slides, Slide Show, Controlling the Slide Show with a Keyboard, Setting Slide Show Timings

### Suggested Readings:

1. P.K Sinha & Priti Sinha, Computer Fundamentals, BPB Publications.
2. Alexix Leon, Mathewes Leon, Fundamentals of Information Technology,
3. Suresh K. Basandra, Computer Systems Today, Galgotia Publications.
4. V. Rajaraman, Fundamentals of Computers,EEE.
5. Peter Nortan, Introduction to Computers, Tata Mcgraw Hill
6. Joyce Coax , Joan Preppernau,,Steve Lambert and Curtis Frye,2007  
Microsoft Office System step by step, Microsoft Press
7. R.K. Taxali, PC Software for Windows

### 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.**

**Course No.: UCAPC-150**

**Duration of Examination: 3 Hrs**

TITLE: PRACTICALS (DOS, WINDOWS, MS-OFFICE)

No. of Credits = 2

Total Marks = 50

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 two internal evaluation tests 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 regular tests, 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

Internal Examination = 25 marks

- Regular Tests = 2 tests ( 5 marks each)
- Viva voice = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

**DETAILED SYLLABUS**  
**(SEMESTER – II)**  
**(Examination to be held in May 2018, 2019 and 2020)**

**Course No.: UCATC-201**

**Duration of Examination: 2 ½ Hrs**

TITLE:        **PROGRAMMING CONCEPTS USING C LANGUAGE**

No. of Credits        = 4

Total Marks        = 100

Semester Exam. = 80

Int. Assessment = 20

**Unit - I**

Algorithm, Representation of Algorithm, Flowcharts, Flowchart Symbols, Flowchart Rules, Advantages and Limitations of Flowcharts, Pseudo Code.

History of C language, Structure of C program, compiling, and running a C program, Errors: syntax, linker and logical errors.

**Unit - II**

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

**Unit - III**

Formatted Input, Formatted Output, escape sequences, Simple if Statement, if..... else Statement, Nesting of if...else Statements, , Switch Statement, conditional Operator, goto Statement, loops, break and continue statement

**Unit – IV**

Qualifiers, Storage classes, Pointers definition, Declaring Pointer Variables, using pointer variable, **Arrays:** One, Two and Multi Dimension Arrays, Initialization of one and two dimensional Arrays, Declaring and Initializing String Variables, String Handling Functions.

**Unit -V**

Preprocessor directives, Function Definition, Function Calls ( call by value & call by address method) Returning Value, Types of Functions, Recursion, Passing Arrays to Functions, Macros, Defining Structure, Declaring and Accessing Structure Variables, Structures and Unions.

### **Suggested Readings:**

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.
6. Shubhnandan S. Jamwal; Programming in C; Pearson Publications; 1e, 2014
7. H.M. Deitel and P.J. Deitel, C How to Program, PHI.

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(5 x 7 = 35 marks)

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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.**



**Course No.: UCAPC-250**

**Duration of Examination: 3 Hrs**

**TITLE: PRACTICALS (C-Language)**

No. of Credits = 2

Total Marks = 50

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 two internal evaluation tests 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 regular tests, 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**

**Internal Examination = 25 marks**

- Regular Tests = 2 tests ( 5 marks each)
- Viva voice = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

**DETAILED SYLLABUS**  
**(SEMESTER – III)**  
**(Examination to be held in Dec 2017, 2018 and 2019)**

**Course No.: UCATC-301**

**Duration of Examination: 2 ½ Hrs**

**TITLE: DATA AND FILE STRUCTURE USING C LANGUAGE**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

**Unit – I**

Introduction and Classification of Data Structures, Data Structure Operations, Time and Space Complexity of Algorithms, Rate of Growth: Big *O* Notation.  
Arrays, Stacks, Queues, Recursion

**Unit – II**

Pointers, Dynamic Memory Allocation, Self-Referential Structures, Linked Lists, Representation of linked list in memory, Traversing a linked list, Searching a Linked list, Memory allocation and Garbage Collection, insertion into linked list, Deletion from linked list, Types of linked list

**Unit-III**

Trees, Binary Trees, Binary Tree Traversal, Binary Search Trees, Heaps.  
Graphs: Representation of Graphs, Breadth First search, Depth First Search, Spanning Trees

**Unit - IV**

**Sorting:** Bubble Sort, Insertion Sort, Selection Sort, Heap Sort, and Merge Sort & Quick Sort.

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

**Unit - V**

**File Structures:** Concepts of Fields, Records and Files, Files: File Organization, Sequential Files, Structure, Operations, Disadvantages, Areas of Use, Direct File Organization, Indexed Sequential File Organization and Text files. Indexing structures like B – trees, ISAM. Hashing Techniques for Direct Files.

## **Suggested Readings**

- 1) Data Structures with C- Seymour Lipschutz, Schaum's Outline Series.
- 2) An Introduction to Data Structures with Applications, Jean Paul Tremblay & Paul G. Sorenson, Tata McGraw Hill.
- 3) Fundamental of Data Structure in C, Ellis Horowitz, Sartaj Sahni, and Susan Anderson-Freed, Silicon Press.
- 4) Data Structures and algorithm in C++ - Adam Drozdek, Cengage Learning.
- 5) Data Structures, Algorithms and applications in C++ - Sartaj Sahni, Universities Press.
- 6) Data Structures Using C and C++ - Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, PHI.
- 7) Data Structure using C++ - D.S Malik, Cengage Learning.

## **Instructions for paper setter**

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### Section A

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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.**

**Course No.: UCAPC-350**

**Duration of Examination: 3 Hrs**

**TITLE: PRACTICALS (BASED ON DATA & FILE STRUCTURE USING C.)**

**No. of Credits = 2**

**Total Marks = 50**

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 at least two internal evaluation tests 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 regular tests, 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**

**Internal Examination = 25 marks**

- Regular Tests           = 2 tests ( 5 marks each)
- Viva voice               = 5 marks
- Practical File           = 5 marks
- Attendance              = 5 marks

# **B.A./B.Sc. Computer Applications**

**(SEMESTER – III)**

**(Examination to be held in Dec 2017, 2018 and 2019)**

## **SKILL ENHANCEMENT COURSE**

**Course No.: UCAPS-351**

**Duration of Examination: 2 ½ Hrs**

### **TITLE: PC ASSEMBLY AND INSTALLATION**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

#### **UNIT - I**

Different input and output devices/ cables, connectors identifications, computer ports, Identifications of different types of motherboard, SMPS, UPS (Online/Offline), controller cards, display cards, sound card AGP cards FAX/Modem Cards, TV Tuner Cards, LAN Cards, Ethernet cards, Different types of RAM used in PC's, Replacement of components etc.

10 hrs

#### **UNIT - II**

Cataloging and purchasing the parts, Assembling the system.  
POST (Power on Self Test), BIOS setting, BIOS Password break  
Formatting/Partitioning of Hard Disk, Installation of Operating System i.e. DOS/Windows.

10 hrs

#### **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.

10 hrs

#### **UNIT - IV**

Different types of Application Software, Application Software Installation, Antivirus Software Installation, Installation of Drivers for Printers, Scanners, Web Camera, working with different control panel option of windows, using system restore features.

10 hrs

#### **UNIT - V**

Basic LAN concepts , Different types of modems, Installation and configuration of Modem, setting up broad band connection, administrative modem settings : creating different wifi network, securing modem using wifi key , admin password, MAC/IP filter etc.

10 hrs

**Suggested Readings:**

1. P.K Sinha & Priti Sinha, Computer Fundamentals, BPB Publications.
2. R.K. Taxali, PC Software for Windows
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, JIBB Publishing.
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, Neo publishing house
7. Diagram Books of different types of Mother Boards.

**Note: Skilled based courses shall be evaluated internally**

**Instructions for paper setter**

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**Section A**

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**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.**

**DETAILED SYLLABUS**  
**(SEMESTER – IV)**  
**(Examination to be held in May 2018, 2019 and 2020)**

**Course No.: UCATC-401**

**Duration of Examination: 2 ½ Hrs**

**TITLE: DATABASE MANAGEMENT SYSTEM & SQL**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

**Unit– I**

Introduction to Data, Field, Record, File, Database, Traditional File Approach (File Management System) Vs Database Management System. Structure of DBMS, Advantages and Disadvantages of DBMS, Database Facilities, Database Users, DBA and its Responsibilities, Schema, Instance, Data Independence, Three Level Architecture of Database.

**Unit – II**

Different Types of Entities and Attributes. Overview of Hierarchical, Network, and Relational database Model, Comparison of these Models. Concept of Keys (primary key, alternate key, candidate key, composite key , super key and foreign key ). Fundamental Integrity Constraints (entity integrity, domain integrity & referential integrity).

**Unit – III**

Database Anomalies, Normalization: Informal Design Guidelines for Relational Schema, Functional Dependencies, Normal Forms Based on Primary Keys (1NF, 2NF, 3NF & BCNF).

**Unit – IV**

Transaction management: properties of transactions, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.

**Unit-V**

DDL, DML, and DCL commands, Overview of SQL, Data Type in SQL, Simple and Nested Query in SQL, Basic SQL Functions, SQL Joins, Data Integrity Constraints, Views.

### **Suggested Readings**

1. An Introduction to Database Systems- Bipin.C.Desai, West Group Publisher.
2. Fundamentals of Database Management System- Elmasri & Navathe, Pearson Education.
3. Introduction to Database Management System- C.J Date, Pearson
4. Simplified Approach to DBMS- Prateek Bhatia, Kalyani Publisher
5. PL/SQL- Ivan Bayros, BPB Publications.
6. Database Systems - Concept, Design and Applications- S.K.Singh, Pearson Education

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(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.**



**TITLE: PRACTICALS (BASED ON Oracle & PL/SQL)****No. of Credits = 2****Total Marks = 50**

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 at least two internal evaluation tests 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 regular tests, 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****Internal Examination = 25 marks**

- Regular Tests           = 2 tests ( 5 marks each)
- Viva voice               = 5 marks
- Practical File           = 5 marks
- Attendance              = 5 marks

# **B.A./B.Sc. Computer Applications**

**(SEMESTER – IV)**

**(Examination to be held in May 2018, 2019 and 2020)**

## **SKILL ENHANCEMENT COURSE**

**Course No.: UCAPS-451**

**Duration of Examination: 2 ½ Hrs**

**TITLE: INFORMATION SECURITY**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

### **UNIT - I**

Networking Concepts Overview: Basics of Communication Systems, Transmission Media, ISO/OSI and TCP/IP Protocols, Local Area Networks, Wide Area Networks, Wireless Networks, Internetworking, Internet.

10 Hrs

### **UNIT - II**

Information Security Concepts: Information Security Overview, Types of Attacks, Goals for Security.

Security Threats and vulnerabilities: Overview of Security threats, Hacking Techniques, Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs, Cyber crime and Cyber terrorism.

10 Hrs

### **UNIT - III**

Cryptography: Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication and Hash functions, Digital Signatures, Public Key infrastructure, Applications of Cryptography

10 Hrs

### **UNIT - IV**

Security Management: Overview of Security Management, Risk Management, Security Procedures and Guidelines, Disaster Recovery.

Network Security: Overview of Identification and Authorization, User Management, DNS Routing, Overview of Firewalls, Types of Firewalls.

10 Hrs

### **UNIT - V**

System and Application Security: Designing Secure Operating Systems, Controls to enforce security services, Information flow model and Biba model. Desktop Security, email security, Web Security, OS Security Vulnerabilities, updates and patches, Anti-virus software, Configuring the OS for security.

10 Hrs

**Suggested Readings:**

1. Malcolm Harkins, *Managing Risk and Information Security: Protect to Enable*, Apress.
2. Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2003
3. Micki Krause, Harold F. Tipton, “Handbook of Information Security Management”, Vol 1-3 CRC Press LLC, 2004.
4. Matt Bishop, “Computer Security Art and Science”, Pearson/PHI, 2002.
5. Bruce Schneier, *Applied Cryptography Second Edition*, John Wiley & Sons, Inc.
6. Sunit Belapure, Nina Godbole, *Cyber Security*, Wiley.

**Note: Skilled based courses shall be evaluated internally**

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**Section C**

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(2 X 15 = 30 marks)

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# **B.A./B.Sc. Computer Applications**

**(SEMESTER – V)**

**(Examination to be held in Dec 2018, 2019 and 2020)**

## **SKILL ENHANCEMENT COURSE**

**Course No.: UCAPS-551**

**Duration of Examination: 2 ½ Hrs**

**TITLE: MULTIMEDIA COMPUTING**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

### **UNIT-I**

Evolution of Multimedia and its objects, Scope of multimedia in business and work, production and planning of Multimedia applications. Multimedia and Hypermedia, World Wide Web, Multimedia hardware, Memory of Storage Devices, Communication Devices, Multimedia Software, Presentation and object generation tools, Video, sound.

10 Hrs

### **UNIT-II**

Digital Audio Concepts, Sampling variables, Loss Less compression, of sound, Lossy compression, Types of Video Signals, Analog Video, Digital Video, Digitization of Sound, MIDI: Musical Instrument Digital Interface, Quantization and Transmission of Audio.

10 Hrs

### **UNIT-III**

Multimedia monitor bitmaps, Vector drawing, Lossy graphic compression, Image standards, JPEG compression, Video representation, video compression, MPEG standards, MHEG standard, recent development in multimedia. Multimedia Application Planning, Costing, Proposal preparation, and Financing-Case study of a typical industry.

10 Hrs

### **UNIT-IV**

Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MOD), Multimedia over Wireless Networks.

10 Hrs

### **UNIT-V**

Content-Based Retrieval in Digital Libraries, Relevance Feedback, Quantifying Results, Querying on Videos, Querying on Other Formats, Outlook for Content-Based Retrieval, Streaming Multimedia over the Internet, Scalable Video Coding, Multiple Description Coding.

10 Hrs

**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 & D.C. Tsichritz: Multimedia programming Object Environment & Frame work, 2000.

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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.**

# B.A./B.Sc. Computer Applications

(SEMESTER – V)

(Examination to be held in Dec 2018, 2019 and 2020)

## DISCIPLINE SPECIFIC ELECTIVE

Course No.: UCATE-501

Duration of Examination: 2 ½ Hrs

TITLE: FUNDAMENTALS OF OPERATING SYSTEM

No. of Credits = 4

Total Marks = 100

Semester Exam. = 80

Int. Assessment = 20

### UNIT-1

**Introduction to Operating System:-** Definition, Evolution of Operating Systems, Features, Types of Operating System: Single user, Multiuser, Batch processing, Time Sharing, Real Time, Multiprogramming, Multitasking, Networking, Distributed, Architecture of Operating System, a brief Description of some Operating systems: Windows, UNIX, LINUX, OS/2, MAC, ANDROID.

10 Hrs

### UNIT-2

**Process Management:-** Process, Process States, Processor Utilization, Response Time, Throughput.

**Interprocess Communication:-** Race Condition, Critical Regions and Mutual Exclusion. Deadlock: Overview, Detection, Avoidance and Prevention, CPU Scheduler, Scheduling Types & Algorithms: FCFS(First Come First Serve), SJF(Shortest Job First), Round Robin, SRT(Shortest Remaining Time).

10 Hrs

### UNIT-3

**Memory Management:-** Memory Partitioning, Swapping, Paging, Segmentation, Virtual Memory: Concept, Demand Paging, Page Replacement Algorithms- FIFO (First in First Out), LRU(Least recently Used), OPT(Optimal Page Replacement), LFU(Least Frequently used).

Disk: Structure, Scheduling & Disk Space Management.

10 Hrs

### UNIT-4

**File Systems:-** Files- File naming, File types, File attributes, Directories- Single level, hierarchical. File access methods; File Allocation Methods:- Continuous Allocation, Chained Allocation and indexed Allocation, Protection and Free Space Management.

**Linux Introduction:-** Basic Features, Advantages, Basic Architecture of UNIX/LINUX system, Kernel, Shell, Difference between UNIX and LINUX.

10 Hrs

## UNIT-5

**UNIX/LINUX:-** UNIX/LINUX Commands for files and Directories:- cd, cp, mv, rm, mkdir, more, less, Creating and viewing files using cat, File view and comparison, Batch Commands- kill, ps, who,sleep. Printing commands- grep, fgrep, find, sort, cal, and banner. File related Commands- ws, sat, cut, grep, dd.

10 Hrs

### Suggested Readings

1. Andrew. S. Tanenbaum : Modern operating systems, pearson prentice hall.
2. A. S. Tanenbaum , A. S. Woodhull : Operating systems-design and implementation, Prentice hall of India Pvt. Ltd.
3. Milenkovic M : Operating system-concepts and design, McGraw hillinternational editions.
4. Silberschartz, Galvin, Gagne : Operating system Principles , WSE wiley.
5. Sumitabha Das- UNIX Concepts and Application, Tata McGraw Hill
6. Richard L. Petersen, The Complete Reference Linux, Tata McGraw Hill

### **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.**

**TITLE: PRACTICALS (BASED ON UNIX/LINUX)**

No. of Credits = 2

Total Marks = 50

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 at least two internal evaluation tests 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 regular tests, 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

Internal Examination = 25 marks

- Regular Tests = 2 tests ( 5 marks each)
- Viva voice = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks



# B.A./B.Sc. Computer Applications

(SEMESTER – V)

(Examination to be held in Dec 2018, 2019 and 2020)

## DISCIPLINE SPECIFIC ELECTIVE

Course No.: UCATE-502

Duration of Examination: 2 ½ Hrs

TITLE: OBJECT ORIENTED PROGRAMMING USING C++

No. of Credits = 4

Total Marks = 100

Semester Exam. = 80

Int. Assessment = 20

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

10 Hrs

### UNIT - II

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

Structured Data Type: Array-Declaration/initialization of one & 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.

10 Hrs

### 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, Operator overloading.

10 Hrs

### UNIT – IV

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

**String-** Declaration/Initialization, string manipulations (counting vowels/ consonants/ digits/ special characters of a string); String Handling and Mathematical functions.

10 Hrs

## **UNIT – V**

Pointers: Declaration/Initialization; Dynamic memory allocation/deallocation operators: new, delete; this pointer;

**Inheritance:** derived class and base class, types of inheritance: single level, multiple, multilevel, hierarchical, hybrid inheritance, derived class constructors, Privately derived, publicly derived and protectedly derived class, accessibility of members from objects, Exception handling.

10 Hrs

### **Suggested Readings:**

1. Herbert Schildt, C++ The Complete Reference, McGraw Hill.
2. Robert Lafore, Object Oriented Programming In C++, Galgotia publ.
3. H.M. Deitel and P.J. Deitel, C++: How to Program, Prentice Hall.
4. Bjarne Stroustrup, The C++ Programming Language, (3rd edition), Addison Wesley.
5. Object Oriented Programming and C++, Balaguruswamy, TMH

### **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.**

**TITLE: PRACTICALS (BASED ON C++ LANGUAGE)**

No. of Credits = 2

Total Marks = 50

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 at least two internal evaluation tests 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 regular tests, 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

Internal Examination = 25 marks

- Regular Tests = 2 tests ( 5 marks each)
- Viva voice = 5 marks
- Practical File = 5 marks
- Attendance = 5 marks

# **B.A./B.Sc. Computer Applications**

**(SEMESTER – VI)**

**(Examination to be held in May 2019, 2020 and 2021)**

## **SKILL ENHANCEMENT COURSE**

**Course No.: UCAPS-651**

**Duration of Examination: 2 ½ Hrs**

**TITLE: WEBSITE DEVELOPMENT TOOLS**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

### **UNIT-I**

A brief introduction to the Internet: URL (Uniform Resource locator), Internet service provider, www, HTTP, Web Portal, web browser, Web Server, domain name system (DNS).

Introduction to HTML, CSS and Javascript

10 Hrs

### **UNIT-II**

Introduction to Expression Web – A website development tool: Understanding web expression Interface, Opening a site, opening a page, using page views, Using browser preview, changing site settings, Changing page editor options, Using expression development server.

10 Hrs

### **UNIT-III**

Creating a new site with expression web: creating a new site from an expression web template, creating an empty site and importing files and folders, Using tables, adding media to a web page, Using Photoshop files in a web page,

10 Hrs

### **UNIT-IV**

Using forms, Understanding validity, Using jquery in a web page.

Creating a website from a scratch: creating an HTML layout, Designing the site architecture & navigation.

10 Hrs

### **UNIT-V**

Considering hosting requirements, finding and registering a domain name, Publishing Protocols, publishing a website, managing a website.

10 Hrs

### **Suggested Readings:**

1. The Internet Book 4<sup>th</sup> Edition-Douglas E Comer, Prentice Hall.
2. Beginning web programming with HTML,CSS,Javascript- John Duccett
3. Step by Step –“Microsoft Expression Web 4” By Chris Leads
4. Learning jquery: Better Interaction Design and web development with simple Javascript Techniques, By Karl swedberg

**Note: Skilled based courses shall be evaluated internally**

### **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.**

# **B.A./B.Sc. Computer Applications**

**(SEMESTER – VI)**

**(Examination to be held in MAY 2019, 2020 and 2021)**

## **DISCIPLINE SPECIFIC ELECTIVE**

**Course No.: UCATE-601**

**Duration of Examination: 2 ½ Hrs**

**TITLE: NETWORKING AND INTERNET**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

### **Unit– I**

Networking definition, Network hardware and software, Types of networks, Advantages of Networking, Topologies, Transmission Medium, Transmission Modes (Simplex, Half duplex and Full duplex), Components (Hub, Connector, Switch, Router, Gateway, Bridge)

### **Unit – II**

Protocol, Client and Server, Internet Protocol, IP Addresses, Classes of IP Addresses, Intranet and Internet (Advantages and Disadvantages), OSI Reference Model, TCP/IP Reference Model, peer to peer network, network security

### **Unit – III**

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

### **Unit – IV**

Introduction to HTML, Format of HTML Program, Formatting Tags, Image Tags, Linking of

Documents, List Tag, Tables Tag, Frames, Forms, Introduction to Cascading Style sheet, Defining Style, Inline Styles, Internal and External Style sheet.

web

### **Unit-V**

Introduction to JavaScript, Variables, Conditional and Loops Control Statement, Functions,

Strings and Mathematical Functions, Window and Document Object and Basic Events.

## **Suggested Readings**

1. Computer Networks- Andrew.S. Tannenbaum, Pearson
2. Data and Computer Communication- Williams Stallings, Pearson
3. Data Communication and Networking- Forouzan, McGraw Hill Professional Publication.
4. The Internet Book- Douglas E. Comer, Prentice Hall.

## **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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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.**

**TITLE: PRACTICALS (BASED ON HTML & JAVASCRIPT)**

No. of Credits = 2

Total Marks = 50

In this course the students shall be exposed to various practical problems based on the above topic.. The Teacher-in-Charge shall design 30-40 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool 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 at least two internal evaluation tests 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 regular tests, 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:-

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# **B.A./B.Sc. Computer Applications**

**(SEMESTER – VI)**

**(Examination to be held in May 2019, 2020 and 2021)**

## **DISCIPLINE SPECIFIC ELECTIVE**

**Course No.: UCATE-602**

**Duration of Examination: 2 ½ Hrs**

**TITLE: JAVA PROGRAMMING**

**No. of Credits = 4**

**Total Marks = 100**

**Semester Exam. = 80**

**Int. Assessment = 20**

### **UNIT - I**

Introduction to Java, Object Oriented concepts, Application of object oriented programming, Features of java programming, Java Virtual Machine, Primitive Data Type and Variables, Java Keywords, Java Operators, Expressions, Control Statements and Arrays.

10 Hrs

### **UNIT - II**

Class and Objects, Constructors, Method Overloading, Static methods, Inheritance, Access Control, Method Overriding, Garbage Collection, Abstract Classes, Polymorphism Packages, Interfaces.

10 Hrs

### **UNIT – III**

Exceptions Handling, Types of Exceptions, try-throw construct, catch, finally keyword, Writing Exception Subclasses, Multithreading, Synchronization in Java.

10 Hrs

### **UNIT – IV**

I/O in Java, Byte Stream Classes, Character Stream Classes, Reading and Writing to Console, Reading and Writing Files, The Transient and Volatile Modifiers, The String and String Buffer Class, Configuring Applets, The Applet Class, Graphics and User Interfaces

10 Hrs

### **UNIT – V**

Basics of AWT, Building User Interface with AWT, Layouts, Layout Manager, Event Handling, Action listener interface, panels, ,checkbox, Dialog and Frames, using menus, adapter classes, Graphics.

10 Hrs

## **Suggested Readings:**

1. Herbert Schildt – “Java2 The Complete Reference”, Tata McGraw Hill.
2. E. Balagurusamy - “ Programming with JAVA”, Tata McGraw Hill
3. Steven Holzner – “Java2 Black Book”, Dreamtech Press.
4. Dietel & Dietel – “Java How to Program”, Pearson Education.
5. Grant Palmer – “Java Programmer’s Reference”, Wrox.

## **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

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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.

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(2 X 15 = 30 marks)

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

**TITLE: PRACTICALS (BASED ON JAVA LANGUAGE)**

No. of Credits = 2

Total Marks = 50

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