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)**
Course code	**Course Title**	**Course code**	**Course name**	
UCATC-501	Fundamentals of Operating System (4 credits)			
UCAPC-550	Practical (Assemble Language and Unix/Linux) (2 credits)			-

Semester – VI

Core Courses		**Skill Enhancement Course (SEC)**		**Elective Discipline Specific(DSE)**
Course code	**Course Title**	**Course code**	**Course name**	
UCATC-601	Networking and Internet (4 credits)			
UCAPC-650	Practicals (DHTML & PHP/XML) (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 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-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

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-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

Note: Skilled based courses shall be evaluated internally

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.

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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)

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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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(2 X 15 = 30 marks)

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

Course No.: UCAPC-450 Duration of Examination: 3 Hrs

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:-

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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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