UNIVERSITY OF JAMMU, JAMMU

BACHELOR OF COMPUTER APPLICATION
(Choice Based Credit System)
(Effective for the session 2017)

1. BCA Programme

The Bachelor of Computer Application (B.C.A.) is an undergraduate programme of three years duration based on Semester System and consist of **six** semester. Each semester will be approximately 5 months duration (minimum 90 working days in a semester). A candidate admitted to the BCA programme will be required to pass the course within the prescribed academic years from the year of admission to the first semester.

PASSING CRITERION

The minimum Grade /Grade Point required to pass each paper in a semester examination under CBCS shall be **Grade D / Grade Point 4** in each theory paper/ Practical/Project (wherever applicable) in External Examination and Internal Assessment separately.

DETERMINATION OF GRADES (Grading System and Computation of SGPA, CGPA)

Grading System:

Absolute grading would be used where the marks obtained are converted to grades based on pre-determined class intervals. To implement the following grading system, the colleges /campuses shall use the following UGC recommended 10-point grading system :

Table 1:Letter Grades and Grade Points

Marks(%)	Letter Grades	Grade Points(G)
90-100	O(Outstanding)	10
80 to < 90	A+(Excellent)	9
70 to < 80	A(Very Good)	8
60 to < 70	B+(Good)	7
50 to < 60	B(Above Average)	6
40 to < 50	C(Average)	5
36 to < 40	D(Pass)	4
0 to < 36	F(Fail)	0
	AB(Absent)	0

(i) A student obtaining Grade F shall be considered failed and will be required to reappear in the examination as per existing rules of the university under Semester System for Under Graduate Courses.

(ii) Grade(D) or percentage of marks (36%) is required to pass in a course, SGPA of 4 to qualify a semester and a minimum CGPA of 4 to qualify for a UG degree.

Computation of SGPA and CGPA

The following procedure shall be used to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

(i) The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e **SGPA** (Si) = Σ(Ci x Gi) / ΣCi ,where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

(ii) The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e. **CGPA =** Σ(Ci x Si) / Σ Ci where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

(iii) The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

2. Eligibility:

Admission to Semester-I of BCA course, under CBCS, shall be open to those candidates who have passed Higher Secondary Part-II examination (under 10+2 pattern) of the J&K State Board of School Education or an examination recognized by the University as equivalent thereto with Mathematics as one of the elective subjects and has obtained not less than 50% of the aggregate marks in the qualifying examination in case of General Category and 45% marks in case of SC/ST candidates.

Provided that the admission in the Govt. Colleges/Non-Government Colleges affiliated to University of Jammu shall be made directly by the Admission Committee of the College concerned on the basis of marks obtained by the candidate/s in the qualifying examination.

Provided that Non-Government Colleges shall follow the same admission schedule and procedure/statutes as are applicable for Govt. Colleges.

Provided further also that the admission to Non-Local Candidates in Non-Govt. Colleges shall be granted under the second preference category.

3. Course Structure

(Semester-wise Course Distribution)

Semester-I				
Core Courses		**Ability Enhancement Compulsory Courses(AECC)**	**Skill Enhancement Courses(SEC)**	**Elective Discipline Specific(DSE)**
Course code	**Course Title**			
UMTTC101*	Differential Calculus (6 Credits)*	EVS-1 (2 Credits)		
UBCATC-101	Problem solving using C-language(4 Credits)	Communication English-1 (2 Credits)		
UBCATC 102	Computer fundamentals (4 Credits)			
UBCAPC 150	Practicals--Based on C-language, DOS , Windows (4 Credits)			

Semester 1 Total Credits =22

*****Syllabus for this course shall be the same as applicable for B.A/B.Sc. “Mathematics”

Semester-2				
Core Courses		**Ability Enhancement Compulsory Courses(AECC)**	**Skill Enhancement Courses(SEC)**	**Elective Discipline Specific(DSE)**
Course code	**Course Title**			
UMTTC201*	Differential Calculus (6 Credits) *	EVS-2 (2 Credits)		
UBCATC 201	Data and File Structures using C-language (4 credit)	Communication English-2 (2 Credits)		
UBCATC-202	Fundamentals of Digital Electronics (4 credit)			

UBCAPC -250	Practicals-Based on Data structure Using C Language , MS-Office (4 credit)			

Semester 2 Total Credits =22

*Syllabus for this course shall be the same as applicable for B.A./B.Sc. “Mathematics”

Semester-3

Core Courses		Ability Enhancement Compulsory Courses(AECC)	Skill Enhancement Courses(SEC) (Opt Any one)		Elective Discipline Specific(DSE)
Course code	**Course Title**		**Course code**	**Course name**	
UMTTC-301*	Real Analysis		UBCAPC-351	PC Assembly and Installation (4 credits)	
UBCATC-301	Fundamentals of Operating System (4 Credits)		UBCAPC-352	Java Programming (4 credits)	-
UBCATC-302	Database Management System (4 Credits)				
UBCAPC-350	Practicals-Based on Oracle (4 Credits)				

Semester 3 Total Credits =22

*Syllabus for this course shall be the same as applicable for B.A./B.Sc. “Mathematics”

Semester-4

Core Courses		Ability Enhancement Compulsory Courses(AECC)	Skill Enhancement Courses(SEC) (Any One)		Elective Discipline Specific(DSE)
Course code	**Course Title**		**Course code**	**Course name**	
UMTTC-401*	Algebra		UBCAPC-451	Internet and Web Technology (4 Credits)	
UBCATC-401	Computer Networks and Internet (4 Credits)		UBCAPC-452	Information Security (4 Credits)	-

UBCATC-402	Object Oriented Programming using C++ (4 Credits)			
UBCAPC-450	Practicals- Based on C++, Web Technologies (4 Credits)			

Semester 4 Total Credits =22

*Syllabus for this course shall be the same as applicable for B.A./B.Sc. “Mathematics”

Semester-5

Core Courses		Ability Enhancement Compulsory Courses (AECC)	Skill Enhancement Courses(SEC)		Discipline Specific Elective (DSE)	
Course code	**Course Title**		**Course code**	**Course name**	**Course code**	**Course name**
Under Process	Under Process		UBCAPS-551	Android Programming (4 Credits)	UBCATE-501	VB .Net (4 Credits)
			UBCAPS-552	Multimedia Computing (4 Credits)	UBCAPE-550	Practicals- Based on VB.Net (4 Credits)
					UMTTE-501*	Matrices (6 Credits)

Semester 5 Total Credits =22

*Syllabus for this course shall be the same as applicable for B.A./B.Sc. “Mathematics”

Semester-6

Core Courses		Ability Enhancement Compulsory Courses(AECC)	Skill Enhancement Courses(SEC)		Discipline Specific Elective (DSE)	
Course code	**Course Title**		**Course code**	**Course name**	**Course code**	**Course name**
Under Process	Under Process		UBCAPS-650	Project (10 Credits)	UBCATE-601	Cloud Computing (4 Credits)
					UBCATE-602	System Analysis & Design (2 Credits)
					UMTTE-601*	Numerical Methods (6 Credits)

Semester 6 Total Credits =22

*Syllabus for this course shall be the same as applicable for B.A./B.Sc. “Mathematics”

Total Credits =22+22+22+22+22+22=132

Note: The distribution of marks in each course shall be made in the manner shown in the table below:

Sno.	No. of Credits in a Course	Marks in the Semester Examination	Marks for Internal Assessment	Total Marks
1	6	120	30	150
2	4	80	20	100
3	2	40	10	50

4. SCHEME OF EXAMINATION/ASSESMENT

The evaluation of each course shall contain two parts :Internal or In Semester Assessment(IA) and External or End-Semester Assessment (EA).The internal grade awarded to the students in each course in a semester shall be published on the notice board at least one week before the commencement of end semester examination. The responsibility of evaluating the internal assessment is vested on the teacher(s) who teaches the course. There will be University Examinations at the end of each semester for both theory and Practical. 20% of the marks allotted to each theory paper and 50% of the marks allotted to each practical paper including field work, wherever prescribed, shall be reserved for internal assessment. The evaluation of a candidate shall be awarded and record thereof maintained in accordance with the Regulations prescribed for the purpose under the CBCS as per the following:

THEORY	**Syllabus to be covered in the examination**	**Time allotted**	**% Weightage (Marks)**
Internal Assesment Test (**Pattern**:One long answer type question of 10 marks and Five short answer type questions of 2 marks each)	Upto 50%(after 45 days)	1 hour	20
External End Semester University Exam (**Pattern**: As proposed by the concerned BOS and approved by Academic Council) or (*)	Upto 100%(after 90 days)	2 hours 30 minutes	80
Total			**100**
PRACTICAL			
Daily evaluation of practical records/ Viva voce/attendence etc.			50(including 20% for attendance,20%for Viva-voce and 60% for day to day performance
Final Practical Performance + viva voce (External Examination)	100% Syllabus		50 (40(paper) +10(viva-voce))
Total			**100**

In case of failure/re-appear category the Internal Assessment earned by the candidate as a regular student shall be carried forward to the subsequent examination.

Internal Assessment Test (2 Credit Course):

Syllabus to be covered: 50%

Time allotted: 1 Hour

Marks : 10

Pattern: One long answer type question of 5 marks and Five short answer type questions of 1 marks each

DETAILED SYLLABUS

BCA--SEMESTER-1ST

(For the Examinations to be Held in Dec 2017, 2018 & 2019)

Course No.: UBCATC-101 TITLE : COMPUTER FUNDAMENTALS
Duration of the Examination: : 2 ½ Hrs

Total Marks = 100
No. of Credits = 4 Semester Exam. = 80
Int. Assessment = 20

Unit I

History of Computer, Generations and Types (Analog Digital and Hybrid), Characteristics, applications, Benefits and limitations. CPU, Memory: Primary (RAM, ROM, PROM, EPROM, EEPROM), Secondary (Hard Disk, Optical disk, blue ray disk, pen drives), I/O Devices.

10 Hrs

Unit II

Number System: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number system. 1's Compliment and 2's Compliment. Conversion from one number system to another. Binary Arithmetic: Addition, subtraction, multiplication and division.
Software and its types, Computer languages and its types, Compiler, Interpreter, Assembler, Linker Loader.

10 Hrs

Unit III

Operating system and its functions. Types of Operating System (single user, multi user, time sharing, multitasking, multiprocessing and distributed). Windows Fundamentals: Anatomy of Windows, Desktop elements, managing files and folders, Installing Softwares.

Unit IV

Word processing and its features, spell check, Grammar Check, Thesaurus, Auto complete, text formatting, Importing and exporting files, Graphics, Tables, Templates and Wizards, Mail Merge, Macros.

10 Hrs

Unit V

Spreadsheet and its features, Entering information in worksheet, Editing cell entry , Moving and Copying data, deleting and insertion cells, rows , columns, custom numeric formats. Working with Formulas and Cell Referencing, Absolute and relative addressing. Functions, Creating Charts, Filters: Auto and Advanced, Creating and using Macros.
Presentation software and its uses, Steps to create power point presentation, Power point views , Inserting pictures/images, Inserting Audio/ video clips, Animating slides etc.

10 Hrs

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.: UBCATC-102

TITLE: PROBLEM SOLVING USING C-LANGUAGE

Duration of the Examination: : 2 ½ Hrs

Total Marks = 100

No. of Credits = 4 Semester Exam.= 80

Int. Assessment = 20

UNIT-I

Problem solving, Algorithm, flow chart, coding, compilation and debugging

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

Character set of C language, identifiers, keywords, data types, variables, constants, expressions. Operators: Mathematical, Unary, Binary, Relational and Logical operators, Operator precedence and associativety.

10 Hrs

UNIT-II

Conditional Control statements: if statement, if else statement, nested if statement, if else if ladder and Ternary operator, Switch case statement, GOTO statement.

Looping control Statements: While loop, Do while Loop, For loop, Nested loops etc.

10 Hrs

UNIT-III

Functions: Definition, Prototypes, Types of Function, Scope, Call by Value.

Storage classes in C, Preprocessor Directives, Macros.

UNIT-IV

Arrays (Single and double dimensional): Definition, Declaration, Accessing, Bound Checking, Passing to function.

Strings: Definition, Declaration, Accessing, Passing to function, Standard Library functions.

10 Hrs

UNIT-V

Arrays and Pointers: Accessing single dimensional array using Pointers, Accessing 2D array using Pointers, Passing arrays to functions with pointers.

Structures & Unions: Declaring, Initializing and Accessing structures, Passing structures to functions, Array of Structures, Nested Structures, Unions initialization and accessing the members of a union.

10 Hrs

Suggested Readings:

1. Gottfried. B, Theory and problems of Programming with C Language, Tata Mc Graw Hill.
2. Kenneth. A, C Problem Solving and Programming, PHI.
3. Dan Gookin,C Programming, Wiley Dreamtech.
4. Y. P. Kanetkar, Understanding Pointers In C, BPB Publications.
5. Shubhnandan S. Jamwal; Programming in C; Pearson Publications; 1e, 2014
6. 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.: UBCAPC-150

TITLE: **Practicals--Based on C-language, DOS , Windows**

Duration of the Examination: 3 Hrs/shift (External exam. be conducted in shifts of 20-25 students)

No. of Credit = 4

Total Marks = 100
External Examination = 50
Internal Assessment = 50

In this course the students shall be exposed to various practical problems based on courses topics mentioned above. The Teacher-in-Charge shall design 30-40 problems based on these courses. 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 three internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of each practical 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:-

Breakup for Internal Assessment:

- Regular Tests = 20 marks (Two tests of 10 marks each)
- Viva-voce Examination = 10 marks
- Practical File = 10 marks
- Attendance = 10 marks

BCA--SEMESTER-2nd

(For the Examinations to be Held in May 2018, 2019 & 2020)

Course No.: UBCATC-201
TITLE: DATA AND FILE STRUCTURES USING C-LANGUAGE
Duration of the Examination: : 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT – I

Introduction and Classifications of Data Structures. Data Structure operations. Time and space complexity of algorithms. Rate of Growth: Big *O* Notation.
Arrays, concept of Stacks and Queues and their implementation using arrays, Recursion
10 Hrs

UNIT - II

Pointers in C, Dynamic Memory Allocation. Self-refrential structures, Linked list, Type of Lists, Applications, Stacks and Queues implementation using linked lists.

UNIT - III

Trees, Binary Trees, Binary Tree Traversal, Binary Search Trees, Complete tree, Heap.
10 Hrs

UNIT - IV

Sorting : Internal and External Sorts, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort
Searching: Linear Search & Binary Search.
Time and space complexity of sorting & search algorithms. 10 Hrs

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, Hashing techniques for direct files.
10 Hrs

Suggested Readings:

1) Data Structures - Seymour Lipschutz (Schaum's Outlines)
2) Data Structure and File Using C - Abhay Abhyankar.
3) Fundamental of Data Structure in C - Sahani.
4) Data Structure Using C - Radhakrishanan and Shrivastav.

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.: UBCATC-202

TITLE: FUNDAMENTALS OF DIGITAL ELECTRONICS

Duration of the Examination: : 2 ½ Hrs

No. of Credits = 4 Total Marks = 100

Semester Exam. = 80

Int. Assessment = 20

UNIT - I

Overview of computers, Integer & floating point representation using IEEE FORMAT, Rules of Floating point Arithmetic, parity, Error detection and correction methods using Hamming technique, ASCII code representation, Number systems & their inter - conversion rules, Rules of addition/ subtraction for r's, (r - 1)'s complements.

10 Hrs

UNIT - II

Logic gates, And, OR, NOT, NAND, XOR, NOR, XNOR Gates & their design.

Boolean Algebra: Binary arithmetic, Boolean Expressions, Laws of Boolean Algebra, De–Morgan laws, K - map, simplification of Boolean Expressions using SOP, POS,

K - map techniques.

10 Hrs

UNIT - III

Combinational circuits: Half & Full adders & subtractors, parallel adders and subtractors.

Encoder, decoder, Multiplexer, De - Multiplexer, code converters.

Sequential circuits: Flip-flop and its types, registers and their types, & bi – directional register.

10 Hrs

UNIT - IV

Memory organization: Memory Hierarchy, Memory, its types (RAM/ROM), characteristics of memory, memory address map to CPU, cache memory.

10 Hrs

UNIT - V

I/O devices FD/HD disks, VDU;I/O organization: Modes of I/O transfer like DMA, programmed control, interrupts technique.

Interrupt & instruction: Interrupt, its types & its life cycle, instruction life cycle.

10 Hrs

Suggested Readings:

1. Gear, C.W., Computer Organization and Programming McGraw – Hill, 1975.
2. Tannenbaum, A.S., Structured Computer Organization Prentice - Hall of India.
3. Mano, M.M., Computer System Architecture, Prentice – Hall, of India, 1983.
4. Langholz, G., Grancioni, J. and Kandel, A.: Elements of Computer Organization, Prentice - Hall International, 1988.
5. Assembler Manual for the chosen machine.
6. Hayes, Computer Architecture and Organization, McGraw – Hill International Edition.
7. Sloan, M.E., Computer Hardware and Organization, 2nd Edn, Galgotia publ., Pvt. Ltd.
8. Floyd: Digital Fundamentals, 3rd edn, Universal bookstall, and pvt.ltd

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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.

Course No.: UBCAPC-250

TITLE: **Practicals-Based on Data structure Using C Language and**

MS-Office.

Duration of the Examination: 3 Hrs/shift
(External exam. be conducted in shifts of 20-25 students)

No. of Credits = 4

Total Marks = 100
External Examination = 50
Internal Assessment = 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 courses. 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 three internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of each practical 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:-

Breakup for Internal Assessment:

- Regular Tests = 20 marks (Two tests of 10 marks each)
- Viva-voce Examination = 10 marks
- Practical File = 10 marks
- Attendance = 10 marks

BCA--SEMESTER-3rd

(For the Examinations to be Held in Dec 2018, 2019 & 2020)

Course No.: UBCATC-301
TITLE: FUNDAMENTALS OF OPERATING SYSTEMS
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT- I
Introduction to Operating System: Definition, Evolution of Operating Systems, types of operating systems.
Operational Overview of Operating System: Physical Organization of Computer Resources. A brief description of some operating systems: Windows, UNIX, Linux, OS/2, Mac, Android.

10 Hrs

UNIT- II
File System and Management: Files, directories, file types and operations, file access and security concerns, file storage management, File Control Blocks, Block Based File storage policies: Continuous allocation, Chained allocation and indexed allocation. Disk partitioning

10 Hrs

UNIT- III
Process Management : Process, process states, processor utilization, response time, processes in Multiprogramming and Time Sharing systems, Inter-Process communication. Process scheduling concept

10 Hrs

UNIT- IV
Memory Management: Main Memory Management, Memory Relocation concept, virtual memory, swapping, paging, segmentation.

10 Hrs

UNIT - V
IO Management: Modes of IO operations: Programmed, Polling, Interrupt and DMA, Device drivers, device controllers, spooling, caching

10 Hrs

Suggested Readings:

1. Silberschatz, Galvin, “Operating System Concepts”, Addison Wesley Publishing Company.
2. William Stallings, “Operating Systems”, Macmillan Publishing Company.
3. Deitel H.M., “An Introduction To Operating System”, Addison Wesley Publishing Company.
4. Tanenbaum, A.S., “Modern Operating System”, Prentice Hall of India.
5. Milenkovic M, “Operating system-concepts and design”, McGraw Hill, International editions.

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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)

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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.

Course No.: UBCATC-302

TITLE: DATABASE MANAGEMENT SYSTEM
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT - I

Overview of DBMS: Data & information, Entity & attributes, Records, files & their types, Database, views, relationships among entities, DBMS: its evolution, components advantages and disadvantages. Architecture of DBMS.

10 hrs

UNIT - II

Relational DBMS: definition, concept of table, keys [primary, unique, candidate, foreign, conjugate] role of database administrator. Data models [traditional, semantic, hierarchical, network, relational] E-R diagram.

10 hrs

UNIT - III

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

10 hrs

UNIT - IV

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

10 hrs

UNIT - V

Security issues: Data security issues, risks, data tampering, data theft, unauthorized access, password related threats, data security requirements [confidentiality, integrity, availability] granting and revoking of privileges and roles, definition of Encryption and Decryption.

10 hrs

Suggested Readings:

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

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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.

Course No.: UBCAPC-351

TITLE: PC ASSEMBLY AND INSTALLATION

Duration of the Examination: 2 ½ Hrs

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.

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.: UBCAPC-352

TITLE: JAVA PROGRAMMING
Duration of the Examination: 2 ½ Hrs
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 Scheldt – “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
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.: UBCAPC-350

TITLE: **Practicals-Based on Oracle**.

Duration of the Examination: 3 Hrs/shift
(External exam. be conducted in shifts of 20-25 students)

No. of Credits = 4

Total Marks = 100
External Examination = 50
Internal Assessment = 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 courses. 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 three internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of each practical 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:-

Breakup for Internal Assessment:

- Regular Tests = 20 marks (Two tests of 10 marks each)
- Viva-voce Examination = 10 marks
- Practical File = 10 marks
- Attendance = 10 marks

BCA--SEMESTER-4th

(For the Examinations to be Held in May 2019, 2020 & 2021)

Course No.: UBCATC-401
TITLE: COMPUTER NETWORKS AND INTERNET
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT - I
Computer Networks: Goals, Applications, Structure and Components, Analog and Digital Transmission, Topologies, Channel Speed, Bit rate, Baud rate, Band Width and Frequency Spectrum, Transmission modes (simplex half duplex and full duplex), Asynchronous and Synchronous Communication, Multiplexing: Definition, TDM, FDM, Phase Multiplexing, Transmission media (guided and unguided), Hardware Components (Hub, Repeater, Bridge, Router and Gateway).

10 hrs

UNIT – II
OSI Reference model, TCP/IP Model, Protocols, IP addresses, Classes of IP addresses, Domain Name system, Concept of Intranet and Extranet, Internet Address, URL, ISP, Applications of Internet: WWW, Search Engines, News-group, E-mail and its Protocols, Web portals, Chat, Audio and Video conferencing, FTP, Remote login

10 hrs

UNIT – III
Network Security: Network security issues, approaches to network security, hacking. Firewalls: types of firewall technology
Encryption and Decryption – Cryptography, Public/Private key encryption.
Overview of Digital Signature and Digital Certificates

10 hrs

UNIT-IV
Introduction to html, format of HTML Program, Formatting tags, Image tags, linking of documents, List Tags, Tables Tags, Frames, Forms, Basic Concept of Style Sheets, CSS, Linking and Embedding of CSS in HTML document, Properties of CSS, inline style Sheets, Dynamic Style Sheets.

10 hrs

UNIT –V
Introduction to JavaScript, variables, conditional and loops control statement, functions, strings and mathematical functions, window and document object and basic events.

10 hrs

Suggested Readings:

1. Computer Networks- Andrew.S. Tannenbaum
2. Data and Computer Communication- Williams Stallings
3. Data Communication and Networking- Forouzan
4. The Internet- Doulas and E. Comer
5. Beginning Web Programming with HTML, CSS and JavaScript- John Ducett

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.: UBCATC-402

TITLE: OBJECT ORIENTED PROGRAMMING USING C++
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT - I

Paradigms of Programming Languages, Procedural programming, Need of OOP, Evolution of OO Methodology and C++, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Applications of OOPs, Objects, classes, encapsulation, abstraction, inheritance, reusability, polymorphism and overloading.

10 Hrs

UNIT - II

Basic program construction, Data types, reference variables, Input output statements, comments, escape sequence, manipulators, type conversion, arithmetic logical and relational operators, For loop, while loop & do loop and if, if…else, switch & other control statements, arrays and Strings, new and delete operator.

10 Hrs

UNIT - III

Functions: passing arguments to functions, returning values from functions, reference arguments, static functions, inline functions, default arguments, variables and storage class and returning by reference, Class and visibility modes, C++ objects, this pointer, object as function argument,function overloading, Operator overloading, Overloading unary and binary operators.

10 Hrs

UNIT - IV

Constructors and its types, overloaded constructors, copy constructors, destructor, Memory management, passing and returning Objects from functions, Structures and classes, static class members, Inheritance: derived class and base class, derived class constructors, types of inheritance: single level, multiple, multilevel, hierarchical, hybrid inheritance, function overriding,

10 Hrs

UNIT - V

Exception handling, file handling, Streams stream classes, stream errors, disk file I/O with streams, file pointers and their manipulations, file handling in text and binary modes.

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), Addision 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.

Course No.: UBCAPC-451

TITLE: INTERNET AND WEB TECHNOLOGY

Duration of the Examination: 2 ½ Hrs

No. of Credits = 4 Total Marks = 100

Semester Exam. = 80

Int. Assessment = 20

UNIT – I

Introduction to Internet: Introduction, Objectives, Evolution, Applications (Email, Social Networking, E-Commerce etc.), Basic of Computer Networks (LAN, MAN, WAN), World Wide Web (WWW).

10 Hrs

UNIT – II

Internet Terms: Web page, website, browsers, Web server, URL, ISP, download and upload, online and offline, Hosting and Domain Name.

10 Hrs

Unit – III

Introduction to HTML, Format of HTML Program, Formatting Tags, Image Tags, Linking of Documents, List Tag, Tables Tag, Frames, Forms.

10 Hrs

Unit – IV

Introduction to Cascading Style sheet, Defining Style, Inline Styles, Internal and External Style sheet.

10 Hrs

Unit – V

Introduction to JavaScript, Variables, Conditional and Loops Control Statement, Functions, Strings and Built-in Functions, Events and Event Handling.

10 Hrs

Suggested Reading

1. HTML 5 and CSS 3 Made Simple by Ivan Bayros.
2. Computer Networks- Andrew.S. Tannenbaum, Pearson.
3. The Internet- Douglas E. Comer, Pearson.
4. Web Programming – Chris bates – Wiley Dreamtech India
5. Internet and Worldwide Web, H.M. Deitel, P.J. Dietel and A.B. Goldberg, 3e, Pearson Education
6. Mastering Javascript and Jscript, James Jaworski, 2e, BPB

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.: UBCAPC-452

TITLE: INFORMATION SECURITY
Duration of the Examination: 2 ½ Hrs
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. rs

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.

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.: UBCAPC-450

TITLE: **Practicals-Based on C++, Web Technologies**

Duration of the Examination: 3 Hrs/shift
(External exam. be conducted in shifts of 20-25 students)

No. of Credits = 4

Total Marks = 100
External Examination = 50
Internal Assessment = 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 courses. 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 three internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of each practical 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:-

Breakup for Internal Assessment:

- Regular Tests = 20 marks (Two tests of 10 marks each)
- Viva-voce Examination = 10 marks
- Practical File = 10 marks
- Attendance = 10 marks

BCA--SEMESTER-5th

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

DISCIPLINE SPECIFIC ELECTIVE (DSE)

Course No.: UBCATE-501

TITLE: VB.NET

Duration of the Examination: 2 ½ Hrs

No. of Credits = 4 Total Marks = 100

Semester Exam. = 80

Int. Assessment = 20

Unit I

Introduction to .NET, NET Framework, Features and architecture, Visual studio, Forms, The VB.NET language- Data Type, Variables, forcing variable, type conversion, conditional statements & loops, Procedures, Argument passing mechanism, operators and expressions.

10 Hrs

Unit II

Classes and objects, Properties, Method and Events, Arrays, Types of arrays, Error-handling, Collection and its types, Inheritance, Overloading & Overriding Access modifiers, constructor and destructors.

10 Hrs

Unit III

Interfaces, Polymorphism, Garbage collection, Regex class, Threading.

Windows applications, windows forms, text boxes, buttons, labels, check boxes, radio buttons, list boxes, combo boxes, built-in-dialogs etc.

10 Hrs

Unit IV

Database Connectivity, Connection object, Command objects, Data adapter, datasets, Data reader, Data validation, Connecting Database, Multiple table connection.

10 Hrs

Unit- V

File Handlings: Opening and closing files, Reading and writing into files, Stream Writers, Stream Reader, Binary Reader, Binary Writer classes.

DataGrid View, Datalist View, Crystal Report-- Table, Queries, Connection to Database.

10 Hrs

Suggested Reading

1. Steven Holzner, Bob Howell, Visual Basic .NET programming- Black Book", Dreamtech Press.
2. Evangelos Petroutsos-, Mastering VB.NET-BPB publications
3. George Peck, "The Complete Reference - Crystal Reports", Tata McGraw Hill
4. Frencesco Balena, "Programming Microsoft Visual Basic. NET", Microsoft Press.
5. David Vitter – " Designing VB.NET Applications – A Developer's indispensable Guide To VB.NET", Dreamtech press.

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.

BCA--SEMESTER-5th

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

DISCIPLINE SPECIFIC ELECTIVE (DSE)

Course No.: UBCAPE-550

TITLE: **Practicals-Based on VB.Net**

Duration of the Examination: 3 Hrs/shift
(External exam. be conducted in shifts of 20-25 students)

No. of Credits = 4

Total Marks = 100
External Examination = 50
Internal Assessment = 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 courses. 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 three internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of each practical 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:-

Breakup for Internal Assessment:

- Regular Tests = 20 marks (Two tests of 10 marks each)
- Viva-voce Examination = 10 marks
- Practical File = 10 marks
- Attendance = 10 marks

BCA--SEMESTER-5th

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

SKILL ENHANCEMENT COURSE

Course No.: UBCAPS-551

TITLE: ANDROID PROGRAMMING
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT-I
What is Android, Android Tools, Your First Android Application, Anatomy of Android Application, Workspaces, Editors in Eclipse, Eclipse Perspective, Refactoring.

10 hrs

UNIT-II
Creating Android Emulator, Creating Snapshot, SD Card Emulation, Sending SMS Messages to the Emulator, Transferring Files into and out of the Emulator, Resetting the Emulator

10 hrs

UNIT-III
Activity, Linking Activity using Intent, Fragments, Calling Build-In Application using Intent,Notifications.

10 hrs

UNIT-IV
Components of a Screen, Display Orientation, Action Bar, Listening to UI Notifications.

10 hrs

UNIT-V
Basic Views, Picker Views, List View, Specialized Fragment, Gallery and Image View, Image Switcher, Grid View, Options Menu, Context Menu, Clock View, Web view.

10 hrs

Suggested Readings:

1. Android Design Patterns: Interaction design solutions for developers by Greg Nudelman
2. Android Recipes: A Problem-Solution Approach By: Dave Smith & Jeff Friesen
3. Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps By: Ian G. Clifton
4. Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) By: Bill Philips & Brian Hardy
5. Hello, Android: Introducing Google's Mobile Development Platform (Pragmatic Programmers) By: Ed Burnette

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.

BCA--SEMESTER-5th

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

SKILL ENHANCEMENT COURSE

Course No.: UBCAPS-552

TITLE: MULTIMEDIA COMPUTING
Duration of the Examination: 2 ½ Hrs
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. Tsichritzs: Multimedia programming Object Environment& Frame work, 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.

BCA--SEMESTER-6th

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

DISCIPLINE SPECIFIC ELECTIVE (DSE)

Course No.: UBCATE-601

TITLE: CLOUD COMPUTING
Duration of the Examination: 2 ½ Hrs
No. of Credits = 4 Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT – I

Introduction to concept of Cloud and Cloud Computing, Evolution of Cloud Computing, Overview of various Service and Deployment models, How cloud computing works, Characteristics, Benefits and Risks in Cloud computing, Need for planning before shifting to Cloud computing.
Cloud computing architecture, Components and constraints of Cloud computing infrastructure.

10 hrs

UNIT – II

Cloud computing technologies: Virtualization and its types(Hardware, Network, Storage and Server virtualization), Hypervisor, Service Oriented Architecture, Grid Computing, Utility Computing.
Deployment models: Features, Advantages and disadvantages of each of the Public, Private, Hybrid and Community Cloud models.

10 hrs

UNIT – III

Service Models: Characteristics, benefits, issues and applications of Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). Types of PaaS, Open SaaS.
Identity as a Service (IaaS): Concept, Single Sign-On (SSO), Federated Identity Management (FIDM), OpenID, Benefits of IaaS. Network as a Service (NaaS): Concept, Characteristics and benefits, Mobile NaaS.

10 hrs

UNIT – IV

Cloud Computing Management activities, Cloud Computing Data Storage: Storage devices, Managed/unmanaged Cloud Storage, Creating Cloud storage systems, Virtual storage containers, Challenges in implementing storage systems.
General Steps for building private cloud using any open source tool. Brief overview of major Cloud Service providers – Amazon Web Services, Microsoft Azure, Google Cloud platform, VMware.

10 hrs

UNIT – V

Security: Various levels of Security requirements (Infrastructure, Network, Host, Application, Data, Storage),Data Privacy and Security Issues. Cloud Security Alliance (CSA) stack model.
Overview of Security mechanisms: Encryption, Public Key infrastructure, Digital Signatures, Identity and access management, Brokered Cloud storage access, Hardened Virtual Server Images, Cloud based security groups.

10 hrs

Suggested Readings:

1. Thomas Erl – Cloud Computing: Concepts, Technology and Architecture – Pearson Education India
2. Kris Jamsa – Cloud Computing : SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and more – Jones & Bartlett Learning
3. Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi – Mastering Cloud Computing – McGraw Hill Education
4. Ronald L Krutz and Russell Dean Vines – Cloud Security – A comprehensive guide to Secure Cloud Computing - Wiley

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.

BCA--SEMESTER-6th

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

DISCIPLINE SPECIFIC ELECTIVE (DSE)

Course No.: UBCATE-602

TITLE: SYSTEM ANALYSIS & DESIGN

Duration of the Examination: 1 ½Hrs — Total Marks = 50

No. of Credits = 2 — Semester Exam. = 40

Int. Assessment = 10

UNIT - I

Software Systems Analysis and Design Life Cycle: Requirements determination, requirements specifications, feasibility analysis, final specifications, hardware and software study, Software system design, Software system implementation, Software system evaluation, Software system modification. Role of Software systems analyst, tools used in Software system analysis Information gathering: strategies, methods, case study Software system requirements specification: classification of requirements as strategic, tactical, operational and statutory.

10 Hrs

UNIT - II

Feasibility analysis: deciding project goals, examining alternative solutions, cost – benefit analysis Tools for systems analysts: data flow diagrams, case study for use of DFD, leveling of DFDs, leveling rules, logical and physical DFDs, software tools to create DFDs. Data oriented Software systems design: entity relationship model, E-R diagrams, relationships, cardinality and participation, data base design.

10 Hrs

Suggested Readings:

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

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

Five short answer type questions of 1 mark each shall be given which may include multiple choice questions, fill in the blanks, one word answer questions.

(5 x 1=5 marks)

Section B

Three medium answer type questions of 5 marks each. The examiner will set four questions out of which the candidate will be required to attempt any three.

(3 x 5=15 marks)

Section C

Two long answer type questions of 10 marks each. The examiner will set three questions out of which the candidate will be required to attempt any two.

(2 x 10=20 marks)

BCA--SEMESTER-6th

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

SKILL ENHANCEMENT COURSE

Course No.: UBCAPS-650

TITLE: **Project**

No. of Credits = 10

Total Marks = 250
External Examination = 150
Internal Assessment = 100

In Sixth semester project work will be assigned to the individual students or group of students in case of bigger project with prior permission of the faculty member of the department. The project work would be carried out in the department as an industrial or research application under the guidance of faculty member. The student is required to submit the certification of successful completion of project from the guide mentioning the total number of hours worked per week and conduct during the project period. A formal project report has to be submitted by each student to the respective guide in prescribed format. Internal evaluation would be carried out by the committee constituted comprising Head of Department, guide and other faculty members of the department. Student has to appear before committee for midterm presentation and final presentation. Committee will conduct the viva-voce; evaluate presentation, project report and demonstration of the project. External evaluation would be carried out by the external examiner appointed by the University and the internal examiner appointed by the college. Examiners will conduct the viva-voce; examine the presentation, project report and demonstration of the project.

Breakup for Internal Assessment:

- Attendance = 20 marks
- Mid Term Evaluation = 40 marks
- Final Evaluation = 40 marks

Project Guidelines

1. The students have to strictly follow the guidelines for the project work
2. Project has to select the project with approval of the guide.
3. Synopsis of the project would be submitted to the guide depicting the title of the project, DFDs, brief description of project etc.
4. Student is required to work in the Computer Lab. on project sanctioned.
5. The project report must be submitted in accordance with the prescribed format.
6. Project report would be submitted to the guide before prescribed date.
7. Two copies of the project report and the software CD must be submitted to the external examiner. One copy of the project shall be returned to the student with the signature of external examiner and the other one shall be retained in the library.
8. Students whose project work would found unsatisfactory shall be given another chance under same or another guide.
9. Students have to make presentations of project work during internal and external assessment.

Outlines of the Project Report

The project report should be prepared in a format prescribed by the department which should also specify the contents and methods of presentation.
(a) The project Report should consist of two parts: - Documentation and Source code.
(b) The source-code and the executable code have to be submitted on CD and student must demonstrate working of the software.
(c) The documentation must contain the Flow charts and Data Flow Diagrams.
(d) As far as possible, the Project should be on a real life problem

DETAILED PROFORMA FOR THE PROJECT REPORT

1. Title of the Project
2. Objectives
3. System Analysis and Design
4. Input to the Project
5. Output generated
6. Details of Hardware Platform used
7. Details of Software Tools used
8. Implementation Issues (Clearly defining the area of Application).
9. Miscellaneous
10. Signature of the Candidature.

PERFORMA FOR CERTIFICATE

This is to certify that this is a bonafied record of the Project entitled _____ was done satisfactory at _____ by Mr./Ms _____ in partial fulfillment of BCA course. This report had not been submitted for any other examination and does not form part of any other course undergone by the candidate.

PLACE:
DATE: SIGNATURE

NAME:
DESIGNATION:

PERFORMA FOR EVALUATION

This is to certify that the Project entitled _____ _____ which was carried out at _____ _____ by Mr./Ms _____ in partial fulfillment of BCA course has been examined and evaluated by the undersigned.

PLACE:
DATE: SIGNATURE

NAME:

DESIGNATION:

ADDRESS: