UNIVERSITY OF JAMMU, JAMMU

BACHELOR OF COMPUTER APPLICATION
(Choice Based Credit System)
(Effective for the session 2016, 2017, 2018)

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** (S_i) = $\Sigma(C_i \times G_i) / \Sigma C_i$,where C_i is the number of credits of the ith course and G_i 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 =** $\Sigma(C_i \times S_i) / \Sigma C_i$
where S_i is the SGPA of the ith semester and C_i 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	Computer fundamentals (4 Credits)	Communication English-1 (2 Credits)		
UBCATC 102	Problem solving using C-language(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**	
Under Process	Under Process		UBCAPC-351	Linux/Unix (4 credits)	
UBCATC-301	Fundamentals of Operating System (4 Credits)		UBCAPC-352	PL/SQL (4 credits)	-
UBCATC-302	Database Management System (4 Credits)				
UBCAPC-350	Practicals-Based on Oracle,PL/SQL (4 Credits)				

Semester 3 Total Credits =22

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**	
Under Process	Under Process		UBCAPC-451	Web Designing (4 Credits)	
UBCATC-401	Computer Networks and Internet (4 Credits)		UBCAPC-452	MATLAB (4 Credits)	-
UBCATC-402	Object Oriented Programming using C++ (4 Credits)				
UBCAPC-450	Practicals-Based on C++, XML (4 Credits)				

Semester 4 Total Credits =22

Semester-5

Core Courses		Ability Enhancement Compulsory Courses (AECC)	Skill Enhancement Courses(SEC) (Opt Any One)		Elective Discipline Specific(DSE) (Any One)	
Course code	**Course Title**		**Course code**	**Course name**	**Course code**	**Course name**
Under Process	Under Process		UBCAPC-551	Android Programming. (4 Credits)	UBCATC-502	Cloud Computing (4Credits)
UBCATC-501	VB .Net (4 Credits)		UBCAPC-552	Multimedia Computing (4 Credits)	UBCATC-503	Numerical Methods (4Credits)
UBCAPC-550	Practicals-Based on VB.net (4 Credits)					

Semester 5 Total Credits =22

Semester-6

Core Courses		Ability Enhancement Compulsory Courses(AECC)	Skill Enhancement Courses(SEC)	Elective Discipline Specific(DSE) (Any One)	
Course code	**Course Title**			**Course code**	**Course name**
Under Process	Under Process			UBCATC-601	Statistics (4 Credits)
UBCAPC- 650	Project (12 Credits)		-	UBCATC-602	Software Project Management (4 Credits)

Semester 6 Total Credits =22

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)	3 hour	80
Total			**100**
PRACTICAL			
Daily evaluation of practical records/Viva voce/attendence etc.			50(including 20% for attendance,20%for Viva-voce and <u>60% for day to day performance</u>
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.

5. Instructions for paper setter for courses with UBCA codes

Component	4 Credit Courses (Theory Paper of a Lab. Oriented Course) 80 Marks	6 Credit Courses (Theory Paper of a Non-Laboratory Course) 120Marks	2 Credit Courses (Theory) 40 Marks
05 Short Answer type	5x2= 10 Marks	5x2= 10Marks	5x1=5
03 Medium Answer type	3x10=30 Marks	3x18 =54 Marks	3x5=15
02 Long Answer type	2x20=40 Marks	2x28=56Marks	2x10=20
Total Semester End Examination Marks in each course	80	120	40

DETAILED SYLLABUS

BCA--SEMESTER-1ST

(For the Examinations to be Held in the year 2016, 2017 & 2018)

Course No.: UBCATC-101   <u>TITLE :</u> COMPUTER FUNDAMENTALS
 Duration of the Examination: 3 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.
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 IV

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 for courses with UBCA codes

Component	4 Credit Courses (Theory Paper of a Lab. Oriented Course) 80 Marks	6 Credit Courses (Theory Paper of a Non-Laboratry Course) 120Marks	2 Credit Courses (Theory) 40 Marks
05 Short Answer type	5x2= 10 Marks	5x2= 10Marks	5x1=5
03 Medium Answer type	3x10=30 Marks	3x18 =54 Marks	3x5=15
02 Long Answer type	2x20=40 Marks	2x28=56Marks	2x10=20
Total Semester End Examination Marks in each course	80	120	40

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: 3 Hrs

No. of Credits   = 4

Total Marks = 100
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, Preprocessors, Macros.
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-IV
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.

Instructions for paper setter for courses with UBCA codes

Component	4 Credit Courses (Theory Paper of a Lab. Oriented Course) 80 Marks	6 Credit Courses (Theory Paper of a Non-Laboratry Course) 120Marks	2 Credit Courses (Theory) 40 Marks
05 Short Answer type	5x2= 10 Marks	5x2= 10Marks	5x1=5
03 Medium Answer type	3x10=30 Marks	3x18 =54 Marks	3x5=15
02 Long Answer type	2x20=40 Marks	2x28=56Marks	2x10=20
Total Semester End Examination Marks in each course	80	120	40

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   = 30 marks (A Minimum of three test shall be conducted
                              during the entire semester. The marks for each test
                              shall be distributed uniformly.)
- Practical File   = 10 marks
- Attendance   = 10 marks

BCA--SEMESTER-2nd

(For the Examinations to be Held in the year 2016, 2017 & 2018)

Course No.: UBCATC-201
TITLE: DATA AND FILE STRUCTURES USING C-LANGUAGE
Duration of the Examination: 3 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.
Trees, Binary Trees, Binary Tree Traversal, Binary Search Trees.
                                                                    10 Hrs

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

UNIT - IV
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 for courses with UBCA codes

Component	4 Credit Courses (Theory Paper of a Lab. Oriented Course) 80 Marks	6 Credit Courses (Theory Paper of a Non-Laboratry Course) 120Marks	2 Credit Courses (Theory) 40 Marks
05 Short Answer type	5x2= 10 Marks	5x2= 10Marks	5x1=5
03 Medium Answer type	3x10=30 Marks	3x18 =54 Marks	3x5=15
02 Long Answer type	2x20=40 Marks	2x28=56Marks	2x10=20
Total Semester End Examination Marks in each course	80	120	40

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: 3 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. 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

Instructions for paper setter for courses with UBCA codes

Component	4 Credit Courses (Theory Paper of a Lab. Oriented Course) 80 Marks	6 Credit Courses (Theory Paper of a Non-Laboratry Course) 120Marks	2 Credit Courses (Theory) 40 Marks
05 Short Answer type	5x2= 10 Marks	5x2= 10Marks	5x1=5
03 Medium Answer type	3x10=30 Marks	3x18 =54 Marks	3x5=15
02 Long Answer type	2x20=40 Marks	2x28=56Marks	2x10=20
Total Semester End Examination Marks in each course	80	120	40

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   = 30 marks (A Minimum of three test shall be conducted during the entire semester. The marks for each test shall be distributed uniformly.)
- Practical File   = 10 marks
- Attendance   = 10 marks