UNIVERSITY OF JAMMU, JAMMU

BACHELOR OF COMPUTER APPLICATION
(Semester System)
(Effective from session 2014-15)

1. Duration of the Course

The Bachelor of Computer Application (B.C.A.), a undergraduate course based on Semester System will consist of **six** semesters duration which will be conducted in three years. Each semester will be approximately 5 months (minimum 90 working days in a semester) duration. A candidate admitted to the BCA programme will be required to pass the course within five academic years from the year of admission to the first semester. The minimum marks required for passing a course shall be as under:

- Theory Examination = 40% (Separately in External Examination and internal Assessment)
- Practical examination = 50% (Separately in External Examination and internal Assessment)
- Project work (BCA- 601, Semester 6^{th}): 50% (Separately in External and internal Evaluation).

2. Eligibility:

Candidates seeking admission to the first semester of BCA programme must have passed **10+2 examination with mathematics** and have secured at least 50% marks.

3. Course Structure
(Semester-wise Course Distribution)

Semester – I

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	Mathematics				
BCA-101	Computer Fundamentals	40	80	20	100
BCA-102	Problem solving using C-language	40	80	20	100
BCA-103	Practicals (Based on BCA-101, 102)	100	50	50	100

Semester – II

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	Mathematics				
BCA-201	Data and File Structures using C-language	40	80	20	100
BCA-202	Fundamentals of Digital Electronics	40	80	20	100
BCA-203	Practicals (Based on BCA-201, 202)	100	50	50	100

Semester – III

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	Mathematics				
BCA-301	Fundamentals of Operating System	40	80	20	100
BCA-302	Database Management System	40	80	20	100
BCA-303	Practicals (Based on BCA-301, 302)	100	50	50	100

Semester – IV

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	Mathematics				
BCA-401	Computer Networks and Internet	40	80	20	100
BCA-402	Object Oriented Programming using C++	40	80	20	100
BCA-403	Practicals (Based on BCA-401, 402)	100	50	50	100

Semester – V

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	General Mathematics				
BCA-501	Software System Design	40	80	20	100
BCA-502	VB.net	40	80	20	100
BCA-503	Practicals (Based on BCA-501, 502)	100	50	50	100

Semester – VI

Paper Code	Paper Name	No. of Contact hours	Max. Marks		Total
			External Exam.	Internal Assessment	
	General English	Same as offered for undergraduate programme			
	General Mathematics				
BCA-601	Project	300	200	100	300

4. Instructions for paper setter for courses with BCA codes

The examination in each theory paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No.1 shall be a compulsory question.

The guidelines for paper setting are given below as:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over the entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

DETAILED SYLLABUS

BCA--SEMESTER-1ST

(For the Examinations to be Held in the year 2014, 2015 & 2016)

Course No.: BCA-101 TITLE : 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 BCA codes

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No.1 shall be a compulsory question.

The guidelines for paper setting are given below as:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over the entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-102 TITLE: PROBLEM SOLVING USING C-LANGUAGE

Duration of the Examination: 3 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, 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 BCA codes

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No.1 shall be a compulsory question.

The guidelines for paper setting are given below as:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over the entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-103 TITLE: PRACTICALS
(BASED ON BCA-101 AND BCA- 102)

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

No. of Credits = 6 Total Marks = 100
External Examination = 50
Internal Assessment = 50

In this course the students shall be exposed to various practical problems based on courses BCA-101 and BCA-102. 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 2015 ,2016 & 2017)

Course No.: BCA-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 BCA codes

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No.1 shall be a compulsory question.

The guidelines for paper setting are given below as:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over the entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-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 BCA codes

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No.1 shall be a compulsory question.

The guidelines for paper setting are given below as:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over the entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-203 TITLE: PRACTICALS

(BASED ON BCA-201 AND BCA -202)

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

No. of Credits = 6

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

In this course the students shall be exposed to various practical problems based on courses BCA-201 and BCA-202. 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-3RD

(For the Examinations to be Held in the year 2015, 2016 & 2017)

Course No.: BCA-301 TITLE: FUNDAMENTALS OF OPERATING SYSTEM

Duration of the Examination: 3 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 HOURS

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 HOURS

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 HOURS

UNIT - IV

Memory and IO Management: Main Memory Management, Memory Relocation concept, virtual memory, swapping, paging, segmentation.
Modes of IO operations: Programmed, Polling, Interrupt and DMA
Device drivers, device controllers, spooling, caching

10 HOURS

Suggested Readings:

1. Operating system Principles by A. Silberschartz, P. Galvin and G. Gagne-WSE wiley.
2. Modern operating systems by Andrew. S. Tanenbaum, Pearson Prentice Hall
3. An Introduction to operating system by H. M. Deitel- Addison-Wesley publications
4. Operating Systems by William Stallings-Pearson Education
5. Operating Systam-A design oriented approach by C. Crowley-Pearson Education

Instructions for paper setter

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-302 TITLE: DATABASE MANAGEMENT SYSTEM

Duration of the Examination: 3 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, Relational DBMS, concept of table, keys [primary, unique, candidate, foreign, conjugate] role of database administrator. Data models [traditional, semantic, hierarchical, network, relational] E-R diagram.

10 HOURS

UNIT - II

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

10 HOURS

UNIT - III

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 HOURS

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 HOURS

Suggested Readings:

1. SQL / PI-SQL — Ivan Byross
2. Database Management System — Bipin Desai
3. Database System Concept — Korth, PHI
4. Schaumûs Outline Series: Fundamentals of Relational Databases — Toledo,TMcH
5. PL/SQL Programming — Urman,TMcH

Instructions for paper setter

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-303 TITLE: PRACTICALS
(BASED ON BCA-301 AND BCA-302)

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

No. of Credits = 6

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

In this course the students shall be exposed to various practical problems based on courses BCA-301 and BCA-302. 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-4TH

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

Course No.: BCA-401 **TITLE: COMPUTER NETWORKS AND INTERNET**

Duration of the Examination: 3 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 HOURS

Unit – II

OSI Reference model, TCP/IP Model, Protocols, IP addresses, Classes of IP addresses, Domain Name system, Concept of Intranet and Extranet, Web server, WWW, Search Engines, Internet Service Providers.

10 HOURS

Unit – III

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 HOURS

Unit – IV

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

10 HOURS

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 examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-402 TITLE: OBJECT ORIENTED PROGRAMMING USING C++

Duration of the Examination: 3 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 HOURS

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, ifé else, switch & other control statements. 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, arrays and Strings.

10 HOURS

UNIT - III

Class and visibility modes, C++ objects, this pointer, object as function argument, function overloading, Operator overloading, Overloading unary and binary operators, new and delete operator, constructors and its types, overloaded constructors, copy constructors, destructor, memory management, passing and returning Objects from functions, Structures and classes, static class members.

10 HOURS

UNIT - IV

Inheritance: derived class and base class, derived class constructors, types of inheritance: single level, multiple, multilevel, hierarchical, hybrid inheritance, function overriding, 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 HOURS

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 examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-403 TITLE: PRACTICALS
(BASED ON BCA-401 AND BCA-402)

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

No. of Credits = 6 Total Marks = 100
Ext. Examination = 50
Int. Assessment = 50

In this course the students shall be exposed to various practical problems based on courses BCA-401 and BCA-402. 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-5TH

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

Course No.: BCA-501 TITLE: SOFTWARE SYSTEM DESIGN

Duration of the Examination: 3 Hrs
No. of Credits = 4

Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

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 HOURS

UNIT - II

Feasibility analysis: deciding project goals, examining alternative solutions, cost ï 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

UNIT - III

Structured Software systems analysis and design: procedure specifications in structured English, examples and cases, decision tables for complex logical specifications, specification oriented design vs procedure oriented .
Data oriented Software systems design: entity relationship model, E-R diagrams, relationships, cardinality and participation, data base design.

UNIT - IV

Data input methods: coding techniques, requirements of coding schemes, error detection of codes, validating input data, input data controls, interactive data input
Designing outputs: output devices, designing output reports, screen design, graphical user interfaces, interactive I/O on terminals.

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 Schwalbe- Thomson Learning
5. An Integrated Approach to Software Engineering by P. Jalote- PHI.

Instructions for paper setter

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-502 **TITLE: VB.NET**

Duration of the Examination: 3 Hrs
No. of Credits = 4

Total Marks = 100
Semester Exam. = 80
Int. Assessment = 20

UNIT–I

Introduction To .NET, .NET Framework Features & Architecture. Introduction To Visual Studio, The VB.NET Language - Data Types, Variables, Forcing Variables Declarations, Scope & Lifetime Of A Variable, Type Conversion, Constants, Operators And Expressions, Choose And Switch Functions, Conditional Statements, Loop Statements.

10 HOURS

UNIT–II

Arrays, Types of Array, Structures, Unstructured Error Handling, Structured Error Handling, Collections and its types, Procedures: Subroutines and Functions, Passing Arguments, Optional Argument, Structures, Concepts Of Classes & Objects, Access Modifiers, Constructors And Destructors, Garbage collection, Regex Class, Inheritance, Overloading & Overriding, Threading.

0 HOURS

UNIT – III

Interfaces, Polymorphism, Message Box, Input Box Working With Forms: Loading, Showing And Hiding Forms, Multiple Document Interface, Method, Properties, Events And Working Of Basic Controls Designing Menus: Context Menu, Access & Shortcut Keys, -Textbox, Label, Link Label, Button, List Box, Combo Box, Checkbox, Picture Box, Radio Button, Panel, Scroll Bar, Timer, List View, Tree View. Openfiledialog, Savefiledialog, Fontdialog, Colordialog, Printdialog.

10 HOURS

UNIT–IV

File Handlings: Opening And Closing Files, Reading And Writing Into Files. Overview Of Ado.Net, Connection Object, Command Object, Data Adapter, Dataset, Data Reader, Connection To Database With Server Explorer, Data Binding, Data Form Wizard, Data Validation, Data Grid, Data List View.

10 HOURS

Suggested Readings:

1. VB.NET Programming Black Book By Steven Holzner ï Dreamtech Publications.
2. Mastering VB.NET By Evangelos Petroutsos- BPB Publications
3. Peter Aitkenôs Visual Basic.NET Programming By Peter Aitken- Dreamtech Publications.
4. Holzner-ñVisual Basic Programingò, Dreamtech Press
5. Designing VB.NET Application - A Developerôs Indispensable Guide To VB.NET By David Vitter- Dreamtech Press.

Instructions for paper setter

The examination in each paper shall be of 3 hours duration. There shall be a total of nine questions of 16 marks each and the candidate has to answer five questions selecting one question from each unit. Question No. 1 shall be a compulsory question.

The guidelines for paper setting are given below:

a. Q. No. 1 will be a compulsory question and shall consist of 4 sub-parts (each of 4 marks) distributed over entire syllabus.
b. The paper setter shall set other eight questions selecting two from each unit.

Distribution of Internal Assessment of 20 Marks :
Class Test = 10 marks
Two written assignments = 10 marks (5 marks each)

Course No.: BCA-503 TITLE: PRACTICALS
(BASED ON BCA-501 AND BCA-502)

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

No. of Credits = 6

Total Marks = 100
Ext. Examination = 50
Int. Assessment = 50

In this course the students shall be exposed to various practical problems based on courses BCA-501 and BCA-502. 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-6TH

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

Course No.: BCA-601 **Title: Project Work**

No. of Credits = 12

Total Marks = 300
External Examination/Evaluation = 200
Internal Examination/Evaluation = 100

Project work will be offered in the Sixth semester of BCA which shall be typically carried out in the department as industrial/ research application individually by the candidates under the guidance of a faculty member. During the project period, a student is expected to work at least 20 hrs/week. At the end of semester-VI, the student has to submit a formal individual project report in a prescribed format. He/she is required to submit a certificate of successful completion of the project from the guide giving total number of hours the candidates has worked toward the project and his conduct during the project work. Evaluation of the project will be carried out by a committee consisting of head of the department, external examiner and the guide by examining the project report, presentation of the project and demonstration of the working model of the project.

Assessment of Project:

At the end of the sixth semester of the course, a student will be examined and evaluated in the Project by an external examiner to be appointed by the University and an internal examiner to be appointed by the college. Both the external and internal examiners shall conduct the Viva-voce of the student for judging the knowledge of the work done and shall also evaluate the project work of the student with respect to each and every component as mentioned in the Outlines/Guidelines of the project report.

PROJECT GUIDELINES

Only the projects submitted by the candidates as per following guidelines shall be evaluated.

1. Project may be selected by the student during the fifth Semester programme.

2. The project must be of approximately 300 man hours and so certified by the supervisor of the project.
3. The project report must be submitted in consonance in the appropriate format under the guidance of the Supervisor.
4. Monthly progress report must be submitted through external guide (if any) in the enclosed format.
5. Project report must be submitted before the prescribed last date.
6. 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.
7. Candidates are required to make a presentation of their project work during their project evaluation.
8. Students whose projects are graded as unsatisfactory will be given one more chance to undertake another project under the same/another supervisor.
9. Evaluation of the project work will be done by external examiner in presence of the internal examiner and the head of the department.

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:

(Seal of the external guide)

PERFORMA FOR EVALUATION

This is to certify that the report of 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: