BACHELOR OF COMPUTER APPLICATIONS

CHOICE BASED CREDIT SYSTEM

Introduction

Bachelor in Computer Application (BCA) is an undergraduate degree course in computer applications. With the rapid growth of IT industry in India, the demand of Computer professional is increasing day by day. This increasing growth of IT industry has created a lot of opportunities for the computer graduates.

BCA is one of the popular courses among the students who want to make their career in the Information Technology field. The duration of the course is 3 years and divided into 6 semesters. This course provides a lot of opportunities to the students who are interested in computer field and wants to work in the IT sector as programmer and Software Developer.

AIM

The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software. It helps students analyze the requirements for system development and exposes students to business software and information systems. This course provides students with options to specialize in legacy application software, system software or mobile applications.

STUDENTS LEARNING OUTCOMES

- Ability to apply Knowledge of Mathematics and science in solving Computational Problems
- Ability to understand the Computing concepts and their applications using the acquired board based knowledge.
- Ability to design set up and conduct practical.
- Ability to use the techniques, skills, and modern Software tools for software development.
- Ability to identify and analyze software application problems in multiple aspect including coding, testing and implementation in industrial applications.
- Ability to design, develop and verify software systems to meet desired needs within realistic constraints ensuring quality, reliability, security in addition to satisfying economical, ethical, social and environmental constraints.
- Ability to apply Enterprise level application software for design of diverse software products.
- An ability to communicate effectively in diverse groups and exhibit leadership qualities.
- An understanding of professional and ethical responsibility.
- To develop an understanding on global environment and its protection.

STRUCTURE OF THE COURSE

SEM	CORE COURSE CR TH- 4 CR Pr – 2	Ability Enhancement Compulsory Course (AECC) (CR 4)	Skill Enhancement Course (SEC) (CR 4)	Elective: Discipline Specific DSE (CR 4)	Total Credits
I	1BCATC0101 **Computer Fundamentals and Office Tools** 1BCATC0102 **Introduction to Programming Paradigms and C Language** 1MATTC0101 Maths 1BCAPC0101	English/MIL Communication Environmental Science			22
II	1BCATC0201 **Computer System Architecture And Assembly language** 1BCATC0202 **Object Oriented Programming in C++** MATTC0201 Maths 1BCAPC0201	English/MIL Communication Environmental Science			22
III	1BCATC0301 **Data Structures and File Processing** 1BCATC0302 **Computer Networks** **1MATTC0301 Maths** 1BCAPC0301		1BCASE0301 PC Assembly and Trouble Shooting (2+2) / 1BCASE0302 Java Programming (2+2)		22
	1BCATC0401 **Database Management Systems**		1BCASE0401 Software Engineering (2+2)		

IV	1BCATC0402 **Operating Systems** **1MATTC0401 Maths** 1BCAPC0401		/ 1BCASE0401 Web Designing Frameworks (2+2)		22
V			1BCASE0501 Open Source Software (2+2) / 1BCASE0502 Mobile Applications (2+2)	1BCADE0501 **VB.NET** 1MATDE0502 **MATHS** 1BCAPR0501 **Project Work / Dissertation**	22
VI			1BCASE0601 Cloud Computing (2+2) /1BCASE0602 PHP (2+2)	1BCADE0601 **Programming with python** 1MATDE0602 **MATHS** 1BCAPR0601 **Project Work / Dissertation**	22

TITLE: FUNDAMENTALS AND OFFICE TOOLS

COURSE CODE : 1BCATC0101	**CREDITS :** 04
DURATION OF EXAMINATION	**TOTAL:** 100 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 20 Marks
MAJOR TEST : 2.5 Hours	**MAJOR TEST:** 80 Marks

UNIT – I ***(12 HOURS)***

Introduction to computer system, characteristics ,Generations ,uses, Data processing: concepts of data processing, Definition of Information and data, digital and analog computer, Input and output devices, keyboard, mouse, joystick, scanner, OCR, OMR, barcode reader, web camera, monitor, printer and its types, plotter.

UNIT-II ***(12 HOURS)***

Software, Types of software, Operating system as user interface, utility programs. Computer Languages and its types (Machine Language, Assembly Language, High Level Language: advantages and disadvantages of computer languages), Translators: Compiler, Linker, Interpreter, Loader.

UNIT-III ***(12 HOURS)***

Storage & Memory concepts: RAM, ROM, PROM, EPROM, EEPROM, cache memory. Secondary storage devices(Floppy disk, Hard disk, magnetic tapes), optical disks, Concept of Track, Sector, Cylinder, Spindle, Platter, Seek Time, Response Time, Latency, Turn-around Time etc.

UNIT – IV ***(12 HOURS)***

Number system and its types, Conversion from one number system to another, binary arithmetic operations, r's and r-1's complement, ASCII, UNICODE, EBCDIC. Overview of Emerging Technologies: Bluetooth, Wi-fi, Cloud Computing, Big Data, Data Mining, Embedded Systems.

UNIT – V ***(12 HOURS)***

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

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

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

SUGGESTED READINGS:

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

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

1. ***The question paper for Semester End Examination will consist of two parts:***
   a) **Part A** will comprise of short answer /objective type questions of 16 marks (five questions of 2 marks and six questions of 1 mark each) covering all five units.
   b) **Part B** will comprise of eight questions of 16 marks each with two questions each from II, III, IV and V units. The students will have to attempt four questions selecting one question from each unit. Each question of 16 marks will have two parts: (i) long answer question of 12 marks (ii) short answer question/numerical problem of 4 marks each. The duration of the examination will be 2.5 hours.
2. **The Minor Test** will be held for unit I of the syllabus. It will comprise of two parts:
   a) **Part A** consists of three long answer questions of 5 marks each and students will have to attempt any two.
   b) **Part B** consists of seven short answer questions of 2 marks each and students will have to attempt any five.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 1st (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE - THEORY)

TITLE: INTRODUCTION TO PROGRAMMING PARADIGMS AND C

COURSE CODE :	1BCATC0102	**CREDITS :**	04
DURATION OF EXAMINATION		**TOTAL:**	100 Marks
MINOR TEST :	01 Hour	**MINOR TEST:**	20 Marks
MAJOR TEST :	2.5 Hours	**MAJOR TEST:**	80 Marks

UNIT-I **(12 HOURS)**

Problem solving, Algorithm, Flowcharting: Branching, Looping, the Connector, Pseudo code, coding, compilation and debugging. History of C language, Structure of C program, compiling, and running a C program, Errors: syntax, linker and logical errors.

UNIT-II **(12 HOURS)**

Character set of C language, identifiers, keywords, data types, variables, constants, expressions. Operators: Mathematical, Unary, Binary, Relational and Logical operators, Operator precedence and associatively. Basic input/output statement, simple 'c' programs

UNIT-III **(12 HOURS)**

Decision making within a program, conditions, relational operators, logical connectives, if statement, if-else statement, loops: while loop, do while, for loop. Nested loops, infinite loops, switch statement, structured programming

UNIT-IV **(12 HOURS)**

Storage classes in C, Preprocessors, Macros. Arrays (Single and double dimensional): Definition, Declaration, Accessing and Bound Checking.

Pointers: Understanding Pointers, Accessing the address of variable, declaring pointer Variables, Intialization, accessing a variable through pointer

UNIT –V **(12 HOURS)**

Top-down approach of problem solving, modular programming and functions, standard library of c functions, prototype of a function: parameter list, return type, function call, passing arguments to a function: call by reference, call by value, Concept of Files, text vs binary files, file modes, read & write operations on both text and binary files.

SUGGESTED READINGS:

1. E. Balaguruswami, Programming in C, PHI
2. Gottfried. B, Theory and problems of Programming with C Language, Tata Mc Graw Hill.
3. Kenneth. A, C Problem Solving and Programming, PHI.
4. Dan Gookin,C Programming, Wiley Dreamtech.
5. Y. P. Kanetkar, Understanding Pointers In C, BPB Publications.
6. H.M. Deitel and P.J. Deitel, C How to Program, PHI.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

1. **The question paper for Semester End Examination will consist of two parts:**
   a) **Part A** will comprise of short answer /objective type questions of 16 marks (five questions of 2 marks and six questions of 1 mark each) covering all five units.
   b) **Part B** will comprise of eight questions of 16 marks each with two questions each from II, III, IV and V units. The students will have to attempt four questions selecting one question from each unit. Each question of 16 marks will have two parts: (i) long answer question of 12 marks (ii) short answer question/numerical problem of 4 marks each. The duration of the examination will be 2.5 hours.
2. **The Minor Test** will be held for unit I of the syllabus. It will comprise of two parts:
   a) **Part A** consists of three long answer questions of 5 marks each and students will have to attempt any two.
   b) **Part B** consists of seven short answer questions of 2 marks each and students will have to attempt any five.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 1ST (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE - PRACTICAL)

TITLE: COMPUTER FUNDAMENTALS AND OFFICE TOOLS & INTRODUCTION TO PROGRAMMING PARADIGMS AND C LANGUAGE

COURSE CODE : 1BCAPC0101	**CREDITS :** 04
	Total: 100 Marks
	Internal Assessment Test: 50 Marks
	Semester End Examination: 50 Marks

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 40-50 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct at least two internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on regular tests, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:-

External Examination = 50 marks
Internal Examination = 50 marks

Distribution of Internal Examination Marks:

Two Internal Assessment Tests of 15 marks each	= 30 Marks
Attendance	= 10 Marks
Presentation/ Seminar	= 10 Marks

Total	***= 50 Marks***

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 1st (CBCS) – B.A/B.SC MATHEMATICS
(CORE COURSE)

(EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: DIFFERENTICAL CALCULUS

COURSE CODE : 1MATTC0101	**CREDITS :** 5+1
DURATION OF EXAMINATION	**TOTAL:** 150 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 30 Marks
MAJOR TEST : 03 Hours	**MAJOR TEST:** 120 Marks

OBJECTIVE:

The student should have a good mathematical background and have knowledge of topics like limits, differentiation and integration. This course will help the student to strengthen his mathematical concepts.

UNIT I: **(18 HOURS)**

Limit and Continuity (ε and δ) definition and examples, Types of Discontinuities, Differentiability of functions, Successive differentiation, Leibnitz's Theorem. Exercises and examples based on these topics.

Unit II: **(18 HOURS)**

Indeterminate forms, Partial differentiation, Partial derivatives of first order,Partial derivatives of first order, homogenous functions, Euler's Theorem on homogenous functions. Exercises and examples based on these topics.

UNIT III: **(18 HOURS)**

Tangents and Normals, Curvature, Asymptotes, Singular points (Double points), Tracing of Curves (Cartesian coordinates only).

UNIT IV: **(18 HOURS)**

Parametric representation of curves, Polar coordinates and tracing of curves in polar coordinates, Area in polar coordinates. Exercises and examples based on these topics.

UNIT V: **(18 HOURS)**

Definition of Maxima and Minima, Rolle's Theorem, Mean Value Theorems, Taylor's Theorem with Lagrange's and Cauchy's form of remainder, Taylor's series and Maclaurin's series of sinx, cosx, e^x , log(1 + x), $(1 + x)^n$.

Books Recommended:

1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002.
2. G. B. Thomas and R. L. Finney, Calculus, Pearson Education, 2007.
3. M.J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2^{nd}, 3^{rd}, 4^{th} and 5^{th} units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 2nd (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: COMPUTER SYSTEM ARCHITECTURE

COURSE CODE : 1BCATC0201	**CREDITS :** 04
DURATION OF EXAMINATION	**TOTAL:** 100 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 20 Marks
MAJOR TEST : 2.5 Hours	**MAJOR TEST:** 80 Marks

UNIT – I ***(12 HOURS)***

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

UNIT – II ***(12 HOURS)***

Number systems, Types of Number System, Number system conversion rules, Arithmetic operations on Number system, Compliment Methods: Need of compliment method and rules of addition/subtraction for r's, (r - 1)'s complements,

UNIT – III ***(12 HOURS)***

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.

UNIT – IV ***(12 HOURS)***

Combinational circuits: Half & Full adders & subtractors, parallel adders and subtractors. Encoder, decoder, Multiplexer, De – Multiplexer. Sequential circuits: Flip-flop and its types, registers and their types

UNIT – V ***(12 HOURS)***

Overview of the Assembly Language, Elementary Instruction Format, Interrupt & Instruction: its types & its life cycle. Assembly Language Instructions like MOV, ADD, SUB, INC etc, Implementing Assembly language instructions in C Language

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 SETTERS AND CANDIDATES:

1. ***The question paper for Semester End Examination will consist of two parts:***
   a) **Part A** will comprise of short answer /objective type questions of 16 marks (five questions of 2 marks and six questions of 1 mark each) covering all five units.
   b) **Part B** will comprise of eight questions of 16 marks each with two questions each from II, III, IV and V units. The students will have to attempt four questions selecting one question from each unit. Each question of 16 marks will have two parts: (i) long answer question of 12 marks (ii) short answer question/numerical problem of 4 marks each. The duration of the examination will be 2.5 hours.
2. **The Minor Test** will be held for unit I of the syllabus. It will comprise of two parts:
   a) **Part A** consists of three long answer questions of 5 marks each and students will have to attempt any two.
   b) **Part B** consists of seven short answer questions of 2 marks each and students will have to attempt any five.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 2nd (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: C++ AND OBJECT ORIENTED PROGRAMMING

COURSE CODE : 1BCATC0202	**CREDITS :** 04
DURATION OF EXAMINATION	**TOTAL:** 100 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 20 Marks
MAJOR TEST : 2.5 Hours	**MAJOR TEST:** 80 Marks

UNIT-I Introduction to C++ and Object Oriented Programming (12 HOURS)

A brief look at Procedure Oriented Programming, A brief look at Object Oriented Programming, Need of OOP, Evolution of OOP Methodology and C++, Basic concepts of OOP Approach, Applications of OO, Benefits of OOP.
C++, its applications, advantages etc., Difference between C and C++

UNIT-II Classes/ Objects and Data Abstraction (12 HOURS)

Variables, datatypes, Reference Variables. Class, Visibility modes, Accessing class members, Class method definition, Scope resolution operator, Inline functions, Default arguments in functions, Making an outside function inline, Objects, Memory allocation of objects, Array as data members, Array of objects, Objects as function arguments, Returning object from functions, Static class members, Static member functions.

UNIT-III Function/ Operator overloading and Friend functions (12 HOURS)

Function overloading, Need for function overloading, Declaring and defining overloaded functions, Calling overloaded functions, Friend functions, Characteristics of friend functions, Forward declaration of class, Friend function's arguments passed by reference. Operator overloading, Introduction, Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> , Overloading Unary Operators, Overloading Binary Operators.

UNIT-IV Constructors/Destructors (12 HOURS)

Lifetime and scope of an object, Constructors, Characteristics of constructor, Default constructor, Parameterized constructor – passing initial values as arguments, Constructors with default arguments, Copy constructor, Guidelines for implementing constructors, Destructors, Characteristics of destructors, Constructor overloading, Using this Pointer, Dynamic Memory Allocation with New and Delete

UNIT-V ***Inheritance*** ***(12 HOURS)***

Introduction to inheritance, Need for inheritance, Defining a derived class, Visibility modes – public, private and protected, significance of visibility modes, Inheritance and base class, Types of inheritance – Single, Multiple, Hierarchical, Multilevel and Hybrid inheritance, Function overriding, Using constructors and destructors in derived classes, Virtual base class, Constructors in derived classes, Member classes: Nesting of classes, Abstract class. Concept of Files, text vs binary files, file modes, read & write operations on both text and binary files. Writing objects in files.

SUGGESTED READINGS:

1. E. Balaguruswami, Programming in C++, PHI
2. Y. P. Kanetkar, Programming in C++, BPB Publications.
3. H.M. Deitel and P.J. Deitel, C++ How to Program, PHI.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

1. ***The question paper for Semester End Examination will consist of two parts:***
   a) **Part A** will comprise of short answer /objective type questions of 16 marks (five questions of 2 marks and six questions of 1 mark each) covering all five units.
   b) **Part B** will comprise of eight questions of 16 marks each with two questions each from II, III, IV and V units. The students will have to attempt four questions selecting one question from each unit. Each question of 16 marks will have two parts: (i) long answer question of 12 marks (ii) short answer question/numerical problem of 4 marks each. The duration of the examination will be 2.5 hours.
2. **The Minor Test** will be held for unit I of the syllabus. It will comprise of two parts:
   a) **Part A** consists of three long answer questions of 5 marks each and students will have to attempt any two.
   b) **Part B** consists of seven short answer questions of 2 marks each and students will have to attempt any five.

Continuous Assessment/End Term Exam Criterion For Under Graduate (General or Honours) Programmes

Theory				
Examination (Theory)	**Syllabus to be Covered in examination**	**Time allotted for the examination**	**Weightage (Marks)**	**Remarks**
Internal Assessment Test	20%	1 Hour	20 %	1. The Internal Assessment test shall be held for the first 20% of the syllabus having 20/30 marks i.e. Covering first unit out of five units 2. It will comprise of two parts **Part A:** Three long answer type questions of 5/8 marks each and student will have to attempt any two. **Part B:** 7/10 short answer type questions of 2 marks each and student will have to attempt any 5/7 questions.

End Semester **Examination**	100% Syllabus	2.5/3 Hours for 4/6 credit courses	80% 80/120 marks for 4/6 credit courses	End Semester Test will be of two parts 1. **Part A**: It will comprise of 5 questions of 2/3 marks and 6/9 questions of 1 mark. (Short answer /objective type question of 16/24 marks) covering all five units with equal weightage to all units. 2. **Part B**: Comprising of eight long answer questions of 16/24 marks each, from 2nd,3rd,4th and 5th units .Two questions shall be set from each unit and student will have the internal choice 3. Each question of 16/24 marks will have two parts: a. long answer question of 12/18 marks b. short answer question/numerical of 4/6 marks **.**
Total			**100%**	**Marks may be rounded off** **to nearest integer**

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 2ND (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE - PRACTICAL)

TITLE: OBJECT ORIENTED PROGRAMMING IN C++

COURSE CODE : 1BCAPC0201 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 50 Marks
Semester End Examination: 50 Marks

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 40-50 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct at least two internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on regular tests, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:-

External Examination = 50 marks
Internal Examination = 50 marks

Distribution of Internal Examination Marks:

Two Internal Assessment Tests of 15 marks each	= 30 Marks
Attendance	= 10 Marks
Presentation/ Seminar	= 10 Marks

Total	***= 50 Marks***

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 2ND (CBCS) – B.A/B.SC MATHEMATICS
(CORE COURSE)

(EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: DIFFERENTIAL EQUATIONS

COURSE CODE : 1MATTC0201	**CREDITS :** 5+1
DURATION OF EXAMINATION	**TOTAL:** 150 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 30 Marks
MAJOR TEST : 03 Hours	**MAJOR TEST:** 120 Marks

OBJECTIVE:

This course is of Differential equation. Student should have prerequisite knowledge of differential equations especially variable separable method, homogenous and linear differential equations.

UNIT I: **(18 HOURS)**

First order exact differential equations, Integrating factors, rules to find an integrating factor. First order, higher degree equations solvable for x, y, p. Clairaut's equation.

UNIT II: **(18 HOURS)**

Linear homogenous equations with constant coefficients of second and third order of the type $f(D)y = g(x)$, where $g(x) = e^{ax}$, cosax, sin ax, x^n their sum and products in pairs.

UNIT III: **(18 HOURS)**

Wronskian and its properties, solving a differential equation by reducing its order, method of variation of parameters, Cauchy- Euler equation.

UNIT IV: **(18 HOURS)**

Order and degree of a partial differential equation, Concept of linear and non-linear partial differential equations, Formation of partial differential equations, Linear partial differential equation of first order, Lagrange's method, Charpit's method.

UNIT V: **(18 HOURS)**

Homogenous and non- homogenous linear partial differential equationsof second and third order with constant coefficients of the type $f(D, D')z = g(x, y)$, where $g(x, y) = 0$,

e^{ax+by}, cos (ax + by), sin (ax + by), $x^m y^n$, Ve^{ax+by} , where V is function of x and y and their sums. Homogenous partial differential equations of the type $[(D + m_1 D')(D + m_2 D')(D + m_3 D')]z = f(x, y)$.

Books Recommended:

1. Shepley L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, 1984.
2. Sneddon, Elements of Partial Differential Equations, McGraw-Hill, International Edition, 1967.
3. Belinda Barnes and Glenn R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab, 2nd Ed., Taylor and Francis group, London and New York, 2009.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2nd, 3rd, 4th and 5th units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: DATA STRUCTURES AND FILE PROCESSING

COURSE CODE : 1BCATC0301 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT – I *(12 HOURS)*

Introduction and Classifications of Data Structures. Data Structure operations. Time and space complexity of algorithms. Rate of Growth: Big *O* Notation.

Unit-II *(12 HOURS)*

Arrays, concept of Stacks and Queues, operations and their implementation using arrays, Recursion

UNIT – III *(12 HOURS)*

Pointers in C, Dynamic Memory Allocation. Self-refrential structures, Linked list, Type of Lists, Applications. Trees, Binary Trees, Binary Tree Traversal, Binary Search Trees.

UNIT – IV *(12 HOURS)*

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.

UNIT – V *(12 HOURS)*

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.

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

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: NETWORKING AND INTERNET

COURSE CODE : 1BCATC0302 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT-I ***(12 HOURS)***

Computer Networks: Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet. Network Models: Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities.

UNIT-II ***(12 HOURS)***

Transmission Media: Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. LAN Topologies: Ring, bus, star, mesh and tree topologies. Network Devices: repeaters, hub, bridge, switch, gateway and router.

UNIT-III ***(12 HOURS)***

Internet Terms: IP Address, IP Classes, DNS, Web page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline. Internet Applications: www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

UNIT-IV ***(12 HOURS)***

Introduction to Web Design: Introduction to hypertext markup language (html) Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. Customized Features: Cascading style sheet (css) for text formatting and other manipulations.

UNIT-V ***(12 HOURS)***

JavaScript Fundamentals: Data types and variables, functions, methods and events, form validation, controlling program flow, JavaScript object model, built-in objects and operators.

Reference Books:

1. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition),PHI, 2010 17
2. B. A. Forouzan, Data Communication and Networking , TMH,2003
3. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANEMENT COURSE)

TITLE: PC ASSEMBLING AND TROUBLE SHOOTING

COURSE CODE : 1BCASE0301 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit I *(12 HOURS)*

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.

Unit II *(12 HOURS)*

POST (Power on Self Test), BIOS setting, BIOS Password break ,Formatting/Partitioning of Hard Disk, Installation of Operating System i.e. DOS/Windows, 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.

Unit III *(12 HOURS)*

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.

Unit IV *(12 HOURS)*

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.

Unit V *(12 HOURS)*

Data Recovery concepts, need for data recovery, tools for data recovery, methods of data recovery, Recovering data after formatting/ deletion, recovering from HDD/Optical Disks/USB Drives/System Restore, need and benefits, creating system restore points, restoring windows installation using system restore, System Backup, creating a backup disk, restoring using backup disk.

Suggested Readings:

1. P.K Sinha & Priti Sinha, Computer Fundamentals, BPB Publications.
2. R.K. Taxali, PC Software for Windows
3. Diagram Books of different types of Mother Boards
4. Programming in Java

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: PROGRAMMING IN JAVA

COURSE CODE : 1BCASE0302 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit-I ***(12 HOURS)***

Introduction to Java: Features of Java, JDK Environment, Object Oriented Programming Concept Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA

Unit-II ***(12 HOURS)***

Java Programming Fundamental :Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch),Looping(for, while) ,Type Casting

Unit-III ***(12 HOURS)***

Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes

Unit-IV ***(12 HOURS)***

Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods. Abstract Class, Interface and Packages: Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages

Unit-V ***(12 HOURS)***

Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.

Books Recommended:

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml,javascript, Perl Cgi , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3rd Edition., 2009

3. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009.
4. E Balagurusamy , Programming with JAVA, TMH, 2007

Continuous Assessment/End Term Exam Criterion For Under Graduate (General or Honours) Programmes

Theory				
Examination (Theory)	**Syllabus to be Covered in examination**	**Time allotted for the examination**	**Weightage (Marks)**	**Remarks**
Internal Assessment Test	20%	1 Hour	20 %	1. The Internal Assessment test shall be held for the first 20% of the syllabus having 20/30 marks i.e. Covering first unit out of five units 2. It will comprise of two parts **Part A:** Three long answer type questions of 5/8 marks each and student will have to attempt any two. **Part B:** 7/10 short answer type questions of 2 marks each and student will have to attempt any 5/7 questions.
End Semester Examination	100% Syllabus	2.5/3 Hours for 4/6 credit courses	80% 80/120 marks for 4/6 credit courses	End Semester Test will be of two parts 1. **Part A**: It will comprise of 5 questions of 2/3 marks and 6/9 questions of 1 mark. (Short answer /objective type question of 16/24 marks) covering all five units with equal weightage to all units. 2. **Part B**: Comprising of eight long answer questions of 16/24 marks each, from 2nd,3rd,4th and 5th units .Two questions shall be set from each unit and student will have the internal choice 3. Each question of 16/24 marks will have two parts: a. long answer question of 12/18 marks b. short answer question/numerical of 4/6 marks **.**
Total			**100%**	**Marks may be rounded off to nearest integer**

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE - PRACTICAL)

TITLE: DATA STRUCTURES AND FILE PROCESSING &COMPUTER NETWORKS

COURSE CODE : 1BCAPC0301 **CREDITS :** 100

Total: 100 Marks
Internal Assessment Test: 50 Marks
Semester End Examination: 50 Marks

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 40-50 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct at least two internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on regular tests, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:-

External Examination = 50 marks
Internal Examination = 50 marks

Distribution of Internal Examination Marks:

Two Internal Assessment Tests of 15 marks each	= 30 Marks
Attendance	= 10 Marks
Presentation/ Seminar	= 10 Marks

Total	***= 50 Marks***

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 3RD (CBCS) – B.A/B.SC MATHEMATICS
(CORE COURSE)

(EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: REAL ANALYSIS

COURSE CODE :	1MATTC0301	**CREDITS :**	5+1
DURATION OF EXAMINATION		**TOTAL:**	150 Marks
MINOR TEST :	01 Hour	**MINOR TEST:**	30 Marks
MAJOR TEST :	03 Hours	**MAJOR TEST:**	120 Marks

OBJECTIVE: This course pertains to real analysis with emphasis on the sequence and series of real numbers. The student should have knowledge of real numbers and its properties, set theory, functions, etc.

Unit I: ***(18 HOURS)***

Finite and infinite sets,examples of countable and uncountable sets. Real line, bounded sets, suprema and infima, completeness property of R, Archimedean property of R. Intervals. Concept of cluster points and statement of Bolzano-Weierstrass theorem

Unit II: ***(18 HOURS)***

Real sequence,Bounded sequence,Cauchy convergence criterion for sequences. Cauchy's theorem on limits, order preservation and Squeeze theorem, monotone sequences and their convergence (monotone convergence theorem without proof).

Unit III: ***(18 HOURS)***

Infinite series.Cauchy convergence criterion for series, positive term series, Geometric series, Comparison test, convergence of p- series, Root test, Ratio test, alternating series, Leibnitz'stest(Tests of convergence without proof). Definition and examples of absolute and conditional convergence.

Unit IV: ***(18 HOURS)***

Sequences and series of functions, point wise and uniform convergence. M_n- test, M- test.

Unit V: ***(18 HOURS)***

Statement of results about uniform convergence and integrability and differentiability of functions, Power series and radius of convergence.

Books Recommended:

1. T.M. Apostol, Calculus(Vol. I), John Wiley and Sons (Asia) P. Ltd., 2002.
2. R.G. Bartle and D.R.Sherbert, Introduction to Real Analysis, John Wiley and Sons(Asia) P. Ltd., 2000.
3. E.Fischer, Intermediate Real Analysis, Springer Verlag, 1983.

4. K.A. Ross, Elementary Analysis- The theory of Calculus Series- undergraduate text in Mathematics, Springer Verlag,2003.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2^{nd}, 3^{rd}, 4^{th} and 5^{th} units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: DATABASE MANAGEMENT SYSTEM

COURSE CODE : 1BCATC0401 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT-I ***(12 HOURS)***

Introduction and applications of DBMS, Traditional File Approach (File Management System) Vs Database Management System, Components, advantages and disadvantages of DBMS, Data Independence, Database System architecture- levels, Mappings, Database, users and DBA

UNIT-II ***(12 HOURS)***

Data models [Network, hierarchical, network, relational], E-R Modeling: Entity types, entity set, attribute and keys [primary, unique, candidate, foreign, conjugate], Relationships, Relation types, E- R diagrams, Database design using ER diagrams

UNIT-III ***(12 HOURS)***

Relational Database design: Anomalies and data redundancies in Database, Features of good relational database design, atomic domain and Normalization (1NF, 2NF, 3NF, BCNF).

UNIT-IV ***(12 HOURS)***

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

UNIT-V ***(12 HOURS)***

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

Suggested Readings

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

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE)

TITLE: OPERATING SYSTEM

COURSE CODE : 1BCATC0402 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT – I ***(12 HOURS)***

Introduction to Operating System: Definition, Objectives and functions of Operating System , Evolution of Operating Systems, Types of Operating System: Batch Processing, Time Sharing, Real Time, Multiprogramming, Multiprocessing, Networking, Distributed, Embedded Systems. OS Service, System Calls.

UNIT-II ***(12 HOURS)***

Processes: Definition, Process Relationship, Process states, Process State transitions , Process Control Block ,Context switching – Threads – Concept of multithreads , Benefits of threads – Types of threads. **Process Scheduling:** Definition , Scheduling objectives ,Types of Schedulers ,Scheduling criteria : CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) , Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR

UNIT-III ***(12 HOURS)***

Interprocess Communication: Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing. Deadlocks: Definition, Deadlock characteristics, Deadlock Prevention , Deadlock Avoidance Deadlock detection and Recovery.

UNIT-IV ***(12 HOURS)***

Memory Management: Memory Partitioning, Swapping, Paging, Segmentation. Virtual Memory: Concepts, Overlays, Demand Paging, Page Replacement Algorithms- FIFP, SC, LRU, OPT, LFU

UNIT-V ***(12 HOURS)***

Commands of DOS and UNIX, Windows System tools like Defragmentation,Task Manager, Disk Cleanup, Computer Management etc, Basic Concept of Windows Registry, Regedit and MS-Config Tools, Attrib Command, Control Panel of Windows. Case Study of Windows/DOS/LINUX

Reference Books:

1. Operating Systems -D.M. Dhamdhere, McGraw Hill Education.
2. Operating Systems - Achyut S. Godbole, Tata McGraw Hill.
3. Understanding Operating System - Flynn & Mctloes, Thomson.
4. Operating Systems – Internals and Design Principles by William Stallings, Prentice Hall.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: SOFTWARE ENGINEERING

COURSE CODE : 1BCASE0401 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit-I ***Software Process:*** ***(12 HOURS)***

Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy.

Unit – II ***(12 HOURS)***

Feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document.

Unit – III ***Design Concepts and Principles:*** ***(12 HOURS)***

Design process and concepts, modular design, design heuristic, design model and document. **software Configuration Management:** The SCM process, Version control, SCM standards.

Unit –IV ***Software Project Management:*** ***(12 HOURS)***

Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects

Univ-V ***Testing:*** ***(12 HOURS)***

Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing boundary conditions, structural testing, regression testing, unit testing, integration testing, validation testing, system testing and debugging.

Books Recommended:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: WEB DESIGNING TOOLS AND FRAMEWORKS

COURSE CODE : 1BCASE0402 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit – I ***Front Page:*** ***(12 HOURS)***

Creating a new website, Graphics In FrontPage, Inserting ClipArt, Inserting File Images, Inserting Images From A File, Creating Thumbnail Images, Resampling, Transparent Areas,Adding A Border,Adding A Bevel To An Image ,Cropping An Image, Adding Text To Images, Hyperlinks, Creating Text Or Image Links, Creating Bookmarks, Working With Tables,Adding a table,Changing a table's border,Merging cells in a table,Specifying width and height,Changing the background,Table alignment,Table shading,Cell padding and cell spacing,FrontPage Themes,Adding a theme,FrontPage Special Components,Adding a marquee.

Unit – II ***JQuery :*** ***(12 HOURS)***

jquery Syntax and jQuery Selector. Fundamentals of jQuery like event, slider, etc. and JQuery References like events, effects, selectors, etc,data validaion using jQuery,jQuery

Unit – III ***Bootstrap*** ***(12 HOURS)***

CSS Overview, Grid system, Typography, Code, Tables, Forms, Buttons, Images, Responsive utilities

Unit – IV **Bootstrap JS** **(12 HOURS)**

'Overview, Transitions, Modal, Dropdown, Tab, Popover, Alert, Button, Collapse, Carousel

Unit – V **(12 HOURS)**

Introduction to XML, Structure of XML document, Data portability using XML, Difference between XML and HTML, XML Schema , DTD, XML entities, types of entities, Attributes, Markups and its use in DTD, XML applications and tools, Creating and Viewing XML document, XML Namespace

Suggested Reading

1. HTML 5 and CSS 3 Made Simple by Ivan Bayros.
2. Mastering Bootstrap 4 Paperback – Import, 30 Sep 2016 by Benjamin Jakobus (Author), Jason Marah (Author)
3. Introducing Microsoft FrontPage 97 Book by Kerry A. Lehto

4. Absolute Beginner's Guide to Microsoft Office FrontPage 2003 Book by Jennifer Ackerman Kettell and Kate Chase
3. The Internet- Doulas and E. Corner, Pearson.

Continuous Assessment/End Term Exam Criterion For Under Graduate (General or Honours) Programmes

Theory				
Examination (Theory)	**Syllabus to be Covered in examination**	**Time allotted for the examination**	**Weightage (Marks)**	**Remarks**
Internal Assessment Test	20%	1 Hour	20 %	1. The Internal Assessment test shall be held for the first 20% of the syllabus having 20/30 marks i.e. Covering first unit out of five units 2. It will comprise of two parts **Part A:** Three long answer type questions of 5/8 marks each and student will have to attempt any two. **Part B:** 7/10 short answer type questions of 2 marks each and student will have to attempt any 5/7 questions.
End Semester Examination	100% Syllabus	2.5/3 Hours for 4/6 credit courses	80% 80/120 marks for 4/6 credit courses	End Semester Test will be of two parts 1. **Part A**: It will comprise of 5 questions of 2/3 marks and 6/9 questions of 1 mark. (Short answer /objective type question of 16/24 marks) covering all five units with equal weightage to all units. 2. **Part B**: Comprising of eight long answer questions of 16/24 marks each, from 2nd,3rd,4th and 5th units .Two questions shall be set from each unit and student will have the internal choice 3. Each question of 16/24 marks will have two parts: a. long answer question of 12/18 marks b. short answer question/numerical of 4/6 marks .
Total			**100%**	**Marks may be rounded off to nearest integer**

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – COMPUTER APPLICATION (BCA)
(CORE COURSE - PRACTICAL)

TITLE: DATABASE MANAGEMENT SYSTEMS & OPERATINGSYSTEMS

COURSE CODE : 1BCAPC0401 **CREDITS :** 100

Total: 100 Marks
Internal Assessment Test: 50 Marks
Semester End Examination: 50 Marks

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 40-50 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct at least two internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on regular tests, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:-

External Examination = 50 marks
Internal Examination = 50 marks

Distribution of Internal Examination Marks:

Two Internal Assessment Tests of 15 marks each = 30 Marks
Attendance = 10 Marks
Presentation/ Seminar = 10 Marks

Total ***= 50 Marks***

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 4TH (CBCS) – B.A/B.SC MATHEMATICS
(CORE COURSE)

EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: ALGEBRA

COURSE CODE : 1MATTC0401	**CREDITS :** 5+1
DURATION OF EXAMINATION	**TOTAL:** 150 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 30 Marks
MAJOR TEST : 03 Hours	**MAJOR TEST:** 120 Marks

OBJECTIVE: This course will enhance the knowledge of students with new concepts in algebra, which they have not read before. The students should have a background of sets and logic to grasp the content of this course.

Unit I: ***(18 HOURS)***

Definition and examples of groups, examples of abelian and non- abelian groups, the group Z_n of integers under addition modulo n and group U(n) of units under Multiplication modulo n. Cyclic groups from number systems, complex roots of unity,permutation group sym(n), Group of quaternion's.

Unit II: ***(18 HOURS)***

Subgroups, cyclic subgroups,the concept of a subgroup generated by a subset and the commutator subgroup of group,examples of subgroups including the centre of a group.

Unit III: ***(18 HOURS)***

Cosets, Index of subgroup,Lagrange's theorem, order of an element, Normal subgroups:their definition, examples,characterizations, Quotient groups.

Unit IV: ***(18 HOURS)***

Definition and examples of rings, examples of commutative and non- commutative rings, rings from number systems, Z_n the ring of integers modulo n,ring of real quaternions, rings of matrices, polynomial rings, and rings of continuous functions.

Unit V: ***(18 HOURS)***

Subrings and ideals, Integral domains and fields, examples of fields: Z_p, Q, R and C. Field of rational functions.

Books Recommended:

1. John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
2. M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.

3. Joseph A.Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa, 1999.
4. George E Andrews, Number Theory, Hindustan Publishing Corporation, 1984.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2^{nd}, 3^{rd}, 4^{th} and 5^{th} units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – COMPUTER APPLICATION (BCA)
(DISCIPLINE SPECIFIC ELECTIVE)

TITLE: PROGRAMMING IN VB. NET

COURSE CODE : 1BCADE0501 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT–I ***(12 HOURS)***

Introduction to .NET, .NET Architecture, .Net framework - Features, Common Language Runtime (CLR), Framework Class Library (FCL). Integrated Development Environment (IDE), Visual Studio and Components, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser, Project Basis, Event driven Programming. SDI and MDI applications.

UNIT–II ***(12 HOURS)***

Data types, variables, forcing variables declarations, Scope & lifetime of a variable, type Conversion, constants, operators and expressions. Conditional statements, loop statements. Arrays, types of array, control array, Error Handling, Collections, Subroutines, Functions, passing arguments, Optional Argument, Returning value from function. Msgbox & Inputbox.

UNIT – III ***(12 HOURS)***

Object Oriented Programming: Concepts of classes & objects, Properties, methods and events, Creating a class, Constructors and Destructors, Inheritance, Access modifiers, Overloading & Overriding, Interfaces, Polymorphism.

UNIT–IV ***(12 HOURS)***

Working with Forms: Loading, showing, hiding and controlling one form within another. Understanding Working of Controls with respect to Method, properties and events - Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label, ContextMenu,

UNIT–V ***(12 HOURS)***

Introduction to database connectivity, Overview of ado.net, Connection Object, Command Object, Data Adapter, Dataset, Data Reader, Connection to database with Server Explorer, Data binding, Data Grid View, Data form wizard, Data Validation.

Text Books:

1. Peter Aitken's Visual Basic.NET Programming by Peter Aitken- Dreamtech Publications.
2. VB.NET Programming Black Book by Steven Holzner –Dreamtech Publications.
3. Mastering VB.NET by EvangelosPetroutsos- BPB Publications
4. Visual Basic.NET Programming by Evjen, Beres, ET AL Wiley, Dreamtech Publications.
5. Beginning Web Programming using VB.NET and Visual Studio .NET by Daniel Cazzulino, et al
6. Designing VB.NET Application - A Developer's Indispensable Guide to VB.NET by David Vitter- Dreamtech Press
7. Michael Halvorson-"VB.Net",PHI
8. Holzner-"Visual Basic Programing",DreamTech Press

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – COMPUTER APPLICATION (BCA)
(DISCIPLINE SPECIFIC ELECTIVE-PRACTICAL)

TITLE: PROGRAMMING IN VB. NET

COURSE CODE : 1BCADP0501 **CREDITS :** 02

Total: 50 Marks
Internal Assessment Test: 25 Marks
Semester End Examination: 25 Marks

In this course the students shall be exposed to various practical problems based on topics mentioned above. The Teacher-in-Charge shall design 20-30 problems based on these topics. The students shall be required to systematically work out the solution of those problems and implement using relevant tool in the computer laboratory. The 50% of the total marks in this paper shall be reserved for internal assessment. The Teacher-in-Charge shall conduct one internal evaluation tests for awarding the students for internal assessment. The students shall also be required to maintain proper record of their practicals in a Practical File which shall be regularly checked by the concerned teacher-in-charge. The internal assessment shall be based on regular tests, practical file and attendance in the laboratory. For the rest of 50% of the total marks there shall be an external examination which shall be conducted jointly by an internal examiner and an external examiner to be appointed by the University. The distribution of marks to various components is given below as:-

External Examination = 25marks
Internal Examination = 25marks

Distribution of Internal and External Examination Marks:

Two Internal Assessment Tests of 10 marks each = 20 Marks
Attendance = 05 Marks

External Examination

Practical performance (writing and implementation) = 15 marks
Viva-voce = 10 Marks

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – COMPUTER APPLICATION (BCA)
(DISCIPLINE SPECIFIC ELECTIVE-PROJECT)

TITLE: PROJECT/DISSERTATION

COURSE CODE : 1BCAPR0501 **CREDITS :** 06

Total: 150 Marks
Internal Assessment Test: 50 Marks
Semester End Examination: 100Marks

Project Work/Dissertation

Project work will be offered in the fifth semester of BCA which shall be typically carried out in the department by the candidates under the guidance of faculty members. The student will be allowed to work on any project based on the concepts studied in core /elective or skill based elective courses. The group size should be maximum of three (3) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well as lab. Classes and a maximum of four(4) projects would be assigned to one teacher. Theory classes will cover project management techniques. During the project period, a student is expected to work at least 15 hrs/week.

At the end of semester-V, 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:

Internal evaluation comprises of:-

a) Day-to-day evaluation of project lab. Work 10 marks
b) Synopsis submission 10 marks
c) Mid-term presentation 15 marks
d) Final presentation of project 15 marks

External evaluation

At the end of the Fifth 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. The project must be of at least 124 man hours and so certified by the supervisor of the project.
2. The project report must be submitted in consonance in the appropriate format under the guidance of the Supervisor.
3. Project report must be submitted before the prescribed last date.
4. 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.
5. Candidates are required to make a presentation of their project work during their project evaluation.
6. Students whose projects are graded as unsatisfactory will be given one more chance to undertake another project under the same/another supervisor.
7. 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:
   a. Documentation; and
   b. 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)

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: OPEN SOURCE SOFTWARE

COURSE CODE : 1BCASE0501 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit – I ***(12 HOURS)***

Computer Software : Definition, Software types (System Software, Application Software and Utilities Programs), Uses of Computer Software in education, agriculture, communication, weather forecasting, business and other areas, Firmware and Freeware software.

Unit – II ***(12 HOURS)***

Introduction to OSS, History, Need of Open Sources , Advantages and disadvantages of OSS, Brief understanding of Software Development Life Cycle, Development and maintenance of Open Source Software.

Unit – III ***(12 HOURS)***

Commercial Software Vs Open Source Software, Free Software Vs Freeware Softwares, Software Licensing - GPL, LGPL and other licenses.

Unit – IV ***(12 HOURS)***

Salient features of OSS like (Open Office, GAMBAS, GIMP, MySQL)

Unit – V ***(12 HOURS)***

Open Source Software Organizations, hands on training on open office, Data recovery softwares, Apache Web Server its installation and deploying website.

Practicals Based on:

1. Find out various Open source software for the concepts studied by you till now.
2. Install the software like Open office, MySQL etc. and perform comparative study of their salient features.
3. Use GIMP for Image Editing
4. Use GAMBAS for creating Admission Forms

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE

TITLE: MOBILE APPLICATIONS

COURSE CODE : 1BCASE0502 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit-I ***(12 HOURS)***

Event Driven Programming: UI event loop, Threading for background tasks, Outlets / actions, delegation, notification, Model View Controller (MVC) design pattern. Mobile application issues: limited resources (memory, display, network, file system), input / output (multi-touch and gestures)

Unit-II ***(12 HOURS)***

Sensors (camera, compass, accelerometer, GPS) Development tools: Apple iOS toolchain: Objective-C, Xcode IDE, Interface Builder, Device simulator.

Unit-III ***(12 HOURS)***

Frameworks: Objective-C and Foundation Frameworks, Cocoa Touch, UIKit, Others: Core Graphics, Core Animation, Core Location and Maps, Basic Interaction. Common UI's for mobile devices: Navigation Controllers, Tab Bars, Table Views, Modal views, UI Layout.

Unit-IV ***(12 HOURS)***

Data Persistence: Maintaining state between application invocations, File system, Property Lists, SQLite, Core Data Remote Data-Storage and Communication: "Back End" / server side of application

Unit-V ***(12 HOURS)***

RESTful programming, HTTP get, post, put, delete, database design, server side JavaScript / JSON. Code signing: security, Keychain, Developers and App Store License Agreement

Books Recommended:

1. Rajiv Ramnath, Roger Crawfis, and Paolo Sivilotti, Android SDK 3 for Dummies, Wiley, 2011.
2. Valentino Lee, Heather Schneider, and Robbie Schell, Mobile Applications: Architecture, Design, and Development, Prentice Hall, 2004.
3. Brian Fling, Mobile Design and Development, O'Reilly Media, 2009. Maximiliano
4. Firtman, Programming the Mobile Web, O'Reilly Media, 2010.
5. Christian Crumlish and Erin Malone, Designing Social Interfaces, O'Reilly Media, 2009.

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 5TH (CBCS) – B.A/B.SC MATHEMATICS
(DISCIPLINE SPECIFIC ELECTIVE - THEORY)

(EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: LINEAR ALGEBRA

COURSE CODE : 1MATDE0502	**CREDITS :** 5+1
DURATION OF EXAMINATION	**TOTAL:** 150 Marks
MINOR TEST : 01 Hour	**MINOR TEST:** 30 Marks
MAJOR TEST : 03 Hours	**MAJOR TEST:** 120 Marks

OBJECTIVE: It is an advanced study of algebra with details of spaces like vector spaces, their basis and linear transformations.

Unit I: ***(12 HOURS)***

Vector spaces, basic properties, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence.

Unit II: ***(12 HOURS)***

Basis and dimension, dimension of subspacesExistence theorem, Extension theorem, results on dimension of sum and quotient of vector spaces.

Unit III: ***(12 HOURS)***

Linear transformations, null space, range, rank and nullity of a linear transformation, matrix representation of a linear transformation.

Unit IV: ***(12 HOURS)***

Algebra of linear transformations, Dual space, Eigen values and Eigen vectors, Characteristic polynomial.

Unit V: ***(12 HOURS)***

Isomorphism's, Isomorphism theorems, inveritibility and isomorphism, change of coordinate matrix.(15 hrs.)

Books Recommended:

1. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice-Hall of India Pvt. Ltd., New Delhi, 2004.
2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
3. S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
4. Gilbert Strang, Linear Algebra and its Applications, Thomson, 2007.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2^{nd}, 3^{rd}, 4^{th} and 5^{th} units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 6TH (CBCS) – COMPUTER APPLICATION (BCA)
(DISCIPLINE SPECIFIC ELECTIVE)

TITLE: PROGRAMMING IN PYTHON

COURSE CODE : 1BCADE0601 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80Marks

UNIT- I 12 Hours

Introduction to Python: Features of Python, Python interpreter, interactive and non-interactive mode, Python vs Other Languages, Application of Python, Pycharm IDE

UNIT – II 12 Hours

Data Types and variables, global variables, Python numbers, strings, Objects like Date and Time, Typecasting, Operators, decision control structures, looping structures, Arrays and Collections, Built in Modules and Functions, User Defined Functions, Recursion, Lambda Functions

UNIT – III 12 Hours

Object Oriented Programming: Classes & objects, overloading, Composition, Inheritance (Single, Multiple and Multi level)

UNIT – IV 12 Hours

Introduction to JSON, Python with JSON, File and Directory handling in Python (Creating, Reading, Writing and Deleting Files) , Regular Expressions, Exception Handling

UNIT – V 12 Hours

Database connectivity in Python – Installing mysql connector, Accessing connector module using connect, cursor, Execute& close functions, Reading single & multiple results of query execution, Executing different types of statements, Executing transactions, Understanding exceptions in database connectivity

TEXT BOOKS:

1. Dive into python, Mark Pilgrim ,A press
2. Python: The Complete Reference, Martin C. Brown
3. Introduction to Python, Dave Kuhlman
4. Beginning Python: Using Python 2.6 and Python 3, James Payne
5. Python Programming: An Introduction to Computer Science, John M. Zelle
6. Learn Python in 1 Day: Complete Python Guide with Examples, Krishna Rungta

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 6TH (CBCS) – COMPUTER APPLICATION (BCA)
(DISCIPLINE SPECIFIC ELECTIVE-PROJECT)

TITLE: PROJECT/DISSERTATION

COURSE CODE : 1BCAPR0601 **CREDITS :** 06

Total: 150 Marks
Internal Assessment Test: 50 Marks
Semester End Examination: 100Marks

Project Work/Dissertation

Project work will be offered in the sixth semester of BCA which shall be typically carried out in the department by the candidates under the guidance of faculty members. The student will be allowed to work on any project based on the concepts studied in core /elective or skill based elective courses. The group size should be maximum of three (3) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well as lab. classes and a maximum of four projects would be assigned to one teacher. Theory classes will cover project management techniques. During the project period, a student is expected to work at least 15 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:

1. **Internal evaluation comprises of:-**
   a) Day-to-day evaluation of project lab. Work 10 marks
   b) Synopsis submission 10 marks
   c) Mid-term presentation 15 marks
   d) Final presentation of project 15 marks

2. External evaluation

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. The project must be of at least 124 man hours and so certified by the supervisor of the project.
2. The project report must be submitted in consonance in the appropriate format under the guidance of the Supervisor.
3. Project report must be submitted before the prescribed last date.
4. 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.
5. Candidates are required to make a presentation of their project work during their project evaluation.
6. Students whose projects are graded as unsatisfactory will be given one more chance to undertake another project under the same/another supervisor.
7. 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:
   a. Documentation; and
   b. 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. 1Title 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)

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 6TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: CLOUD COMPUTING

COURSE CODE : 1BCASE0601 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

Unit-I ***(12 HOURS)***

Cloud Introduction: Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , usage scenarios and Applications , Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

Unit-II ***(12 HOURS)***

Cloud Services : Types of Cloud services- Software as a Service, Platform as a Service, Infrastructure as a Service , Database as a Service, Monitoring as a Service, Communication as services. Introduction to Service providers: Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduce.

Unit-III ***(12 HOURS)***

Collaborating With Cloud: Collaborating on Calendars, Schedules and Task Management – Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing, Databases – Storing and Sharing Files- Collaborating via Web-Based Communication Tools – Evaluating

Unit-IV ***(12 HOURS)***

Web Mail Services – Collaborating via Social Networks – Collaborating via Blogs and Wikis, Virtualization For Cloud: Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties.

Unit-V ***(12 HOURS)***

Security, Standards, And Applications
Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

Books Recommended:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz "Cloud Computing " Wiley India Edition,2010
2. John Rittinghouse & James Ransome, "Cloud Computing Implementation Management and Strategy", CRC Press, 2010
3. Antohy T Velte ,Cloud Computing : "A Practical Approach", McGraw Hill,2009
4. Michael Miller, Cloud Computing: "Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing, August 2008.
5. James E Smith, Ravi Nair, "Virtual Machines", Morgan Kaufmann Publishers, 2006.

Online Reading/Supporting Material

1. Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing", Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008
2. webpages.iust.ac.ir/hsalimi/.../89.../Cloud%20Common%20standards.pptop ennebula.org,
3. www.cloudbus.org/cloudsim/, http://www.eucalyptus.com/
4. hadoop.apache.org

CLUSTER UNIVERSITY JAMMU

SYLLABUS – SEMESTER 6TH (CBCS) – COMPUTER APPLICATION (BCA)
(SKILL ENHANCEMENT COURSE)

TITLE: PHP LANGUAGE

COURSE CODE : 1BCASE0602 **CREDITS :** 04

Total: 100 Marks
Internal Assessment Test: 20 Marks
Semester End Examination: 80 Marks

UNIT–I ***(12 HOURS)***

Introduction to PHP, Evaluation of PHP, Common uses of PHP, Characteristics of PHP, PHP Environment Setup - Installation of XAMP Server and Configuration files (PHP.ini), PHP Basic Syntax, Defining variable and constant, PHP Data type, Operator and Expression, Operator Precedence and Associatively.

UNIT–II ***(12 HOURS)***

Conditional statements (If, If...Else, If...Else If, Nested If, Switch), Flow Control and Loops statements (while Loop, For Loop, Do While Loop, Goto, Break, Continue, exit).

UNIT–III ***(12 HOURS)***

Arrays, types of array, Associative array, Array Library functions. Functions, passing arguments, Call by value and Call by reference, Optional Argument, Returning value from function. String - Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function.

UNIT – IV ***(12 HOURS)***

Handling HTML Form with PHP, Capturing Form Data using $_POST and $_GET, Redirecting a form after submission.

Understanding file & directory, Opening and closing, a file, Coping, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading (using $_FILES).

UNIT–V ***(12 HOURS)***

Database Connectivity with MySQL, Introduction to RDBMS, Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Executing query through PHP programs

Text Books:

1. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
3. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014.
4. Luke Welling, Laura Thompson, PHP and MySQL Web Development", 4th Edition, Addition Paperback, Addison-Wesley Professsional,2008.
5. David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

CLUSTER UNIVERSITY OF JAMMU

SYLLABUS – SEMESTER 6TH (CBCS) – B.A/B.SC MATHEMATICS
(DISCIPLINE SPECIFIC ELECTIVE - THEORY)

(EXAMINATION TO BE HELD IN 2017, 2018 AND 2019)

TITLE: COMPLEX ANALYSIS

COURSE CODE :	1MATDE0602	**CREDITS :**	5+1
DURATION OF EXAMINATION		**TOTAL:**	150 Marks
MINOR TEST :	01 Hour	**MINOR TEST:**	30 Marks
MAJOR TEST :	03 Hours	**MAJOR TEST:**	120 Marks

OBJECTIVE: Here we deal with different functions particularly the complex functions and their properties. The students should have background of real analysis and complex numbers.

Unit I: ***(18 HOURS)***

Properties of complex numbers, regions in the complex plane, functions of complex variable, mappings. Derivatives, differentiation formulas, Cauchy- Riemann equations.

Unit II: ***(18 HOURS)***

Analytic functions, examples of exponential function, Logarithmic function, trigonometric function, derivatives of function.

Unit III: ***(18 HOURS)***

Definite integrals of functions. Contours, Contour integrals and its examples, upper bounds for moduli of contour integrals. Cauchy-Goursat Theorem, Cauchy integral formula.

Unit IV: ***(18 HOURS)***

Liouville's Theorem and the fundamental Theorem of Algebra. Convergence of sequences and series, Taylor series and its examples.

Unit V: ***(18 HOURS)***

Laurent series and its examples, absolute and uniform convergence of power series and examples based on these topics.

Books Recommended:

1. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, 8th Ed., McGraw-Hill, International Edition, 2009.
2. Joseph Bak and Donald J. Newman, Complex analysis, 2nd Ed., Undergraduate Texts in Mathematics, Springer- Verlag New York, Inc., New York, 1997.
3. S.Ponnusamy, Foundations of Complex Analysis, Narosa Pub. House, 1997.

INSTRUCTIONS FOR PAPER SETTERS AND CANDIDATES:

Minor Test:

1) The Minor Test shall be held for the first 20% of the syllabus having 30 marks i.e. covering first unit out of five units.
2) It will comprise of three long answer type questions of 8 marks each and students will have to attempt any two and 10 short answer type questions of 2 marks each and student will have to attempt any 7 questions.

Major Test: It will be of two parts

1) **Part A:** It will comprise of 5 questions of 3 marks and 9 questions of 1 mark. (Short answer/objective type question of 24 marks) covering all five units with equal weightage to all units.
2) **Part B:** Comprising of eight long answer questions of 24 marks each, from 2^{nd}, 3^{rd}, 4^{th} and 5^{th} units. Two questions shall be set from each unit and student will have the internal choice.
   Each question of 24 marks will have two parts:
   i) Long answer question of 18 marks.
   ii) Short answer question/numerical of 6 marks.