

**Rayat Shikshan Sanstha's**  
**Sadguru Gadage Maharaj College, Karad**  
**(An Autonomous College)**  
**B.Sc. Computer Science (Entire) Part-I**  
**Semester-I & II**  
**STRUCTURE OF COURSE**

**TITLE:** B.Sc. Computer Science (Entire) Part-I

**YEAR OF IMPLEMENTATION:** 2019-20

**PREAMBLE:**

There are bright career prospects for computer science professionals or software professionals in recent scenario. With the opening of huge software and IT companies in India, the job opportunities for trained professionals have increased considerably. India is known to be a leader in software and IT sector.

Computer science graduates pass outs find job opportunities in a variety of environments in academia, research, industry, government, private, business organizations and so on.

They are involved in analyzing problems for solutions, formulating and testing, using advanced communications or multi-media equipment, or working in teams for product development.

The software and IT companies are the major employers of computer science graduates. They offer the best packages to the young graduates which are unmatched with other branches of science.

**GENERAL OBJECTIVES OF THE COURSE:**

- The content of the syllabus have been framed as per UGC norms of CBCS Pattern.
- The students are expected to understand the fundamentals, principles, mathematical, recent IT concepts and recent developments in the subject area.
- The practical course is in relevance to the theory courses to improve the understanding of the concepts.
- It is expected to inspire and boost interest of the students towards Computer Science as the main subject.
- To develop the power of appreciations, the achievements in Computer and role in nature and society.
- To enhance student sense of enthusiasm towards IT and to involve them in an intellectually stimulating experience of learning in a supportive environment.

## Eligibility:

Candidate should have passed standard XII (10+2) in science stream (Mathematics compulsory) with minimum 50% marks or government approved equivalent diploma in Engineering/ Technology from any recognized Board.

## PEO, PO and CO Mappings:

### Program Educational Outcomes:

After completion of this program, the graduate's students would:

PEO I	Technical Expertise	Learn and implement fundamental knowledge of basic courses for developing effective computer program development and its logic in different languages.
PEO II	Successful Career	Learn basic as well as advanced skills in computer science and its applications within different domain.
PEO III	Interdisciplinary and Life Long Learning	Learn and develop confidence, soft skills, leadership, team work ability with society ethics.

### Program Outcomes (PO's):

After completion of program Students / graduates will be able to:

- PO1:** Practice and grow as computing professionals, conducting research and / or leading, designing ,developing or maintaining projects in various technical areas of computer science.
- PO2:** Utilize knowledge and skill in computer science effectively for improving the society
- PO3:** Use new technical advancements of computer science to produce tangible contributions in the profession
- PO4:** Substantial knowledge of abroad class of problem solving technique.
- PO5:** Ability to readily work with other disciplines
- PO6:** Appropriate, occasional innovation of our curriculum so it incorporates ever changing computer science technology.
- PO7:** Recognize the need for interdisciplinary, an ability to engage in life-long learning subjects like Mathematics, Electronics and its logical applications related to computer science (Entire)

**COURSE OUTCOMES (CO'S):**

The following student course outcomes describe the skills imparted by our computer science program:

**CO1:** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

**CO2:** Communicate effectively in variety of professional contexts.

**CO3:** Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

**CO4:** Function effectively as members or leader of a team engaged in activities appropriate to the programs discipline.

**CO5:** Design, implement and evaluate a computing –based solution to meet a given set of computing requirements in the context of the programs discipline.

**CO6:** Apply computer science theory and software development fundamentals to produce computing based solutions.

**DURATION:** 3 YEAR

**PATERN:** CBCS SEMESTER

**MEDIUM OF INSTRUCTION:** ENGLISH

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**B.Sc. Computer Science (Entire) Part-I  
Semester-I**

**COURSE STRUCTURE UNDER AUTONOMY**

**FIRST SEMESTER (NO OF THEORY & PRACTICAL PAPERS)**

Paper Code	Paper Name	TEACHING SCHEME						
		Theory			Practical			
		No. of lectures	Hours	Credits	Subject	No. of lectures	Hours	Credits
BCSE-101	Computer Organization	3	2.4	2	BCSE-110: LAB1- COMPUTER	4	3.2	2
BCSE-102	C Programming-I	3	2.4	2				
BCSE-103	Discrete Mathematical Structure	3	2.4	2	BCSE- 111: LAB2- MATHEMATIC S	4	3.2	2
BCSE-104	Computational Algebra	3	2.4	2				
BCSE-105	Computational Statistics-I	3	2.4	2	BCSE- 112: LAB3- STATISTICS	4	3.2	2
BCSE-106	Statistical Methods-I	3	2.4	2				
BCSE-107	Electronic Fundamentals for Computer	3	2.4	2	BCSE- 113: LAB4- ELECTRONICS	4	3.2	2
BCSE-108	Discrete Electronics for Computer	3	2.4	2				
BCSE-109	English for communication-I	3	2.4	2				
<b>Total of SEM-I</b>		<b>27</b>	<b>21.6</b>	<b>18</b>		<b>16</b>	<b>12.8</b>	<b>8</b>

**SECOND SEMSTER (NO OF THEORY & PRACTICAL PAPERS)**

Paper Code	Paper Name	TEACHING SCHEME						
		Theory			Practical			
		No. of lectures	Hours	Credits	Subject	No. of lectures	Hours	Credits
BCSE - 201	Operating System Concepts	3	2.4	2	BCSE-210: LAB5- COMPUTER	4	3.2	2
BCSE - 202	C Programming-II	3	2.4	2				
BCSE - 203	Graph Theory and Algorithms	3	2.4	2	BCSE- 211: LAB6- MATHEMATI CS	4	3.2	2
BCSE - 204	Computational Calculus	3	2.4	2				
BCSE - 205	Computational Statistics-II	3	2.4	2	BCSE- 212: LAB7- STATISTICS	4	3.2	2
BCSE - 206	Statistical Methods-II	3	2.4	2				
BCSE - 207	Electronic Circuits for Computer	3	2.4	2	BCSE-213: LAB8- ELECTRONIC S	4	3.2	2
BCSE - 208	Digital Fundamentals for Computer	3	2.4	2				
BCSE - 209	English for communication-II	3	2.4	2				
<b>Total of SEM-II</b>		<b>27</b>	<b>21.6</b>	<b>18</b>		<b>16</b>	<b>12.8</b>	<b>8</b>

## Examination Scheme

### Semester - I

Paper Code	Paper Name	SEE	Internal Exam		Subject	Practical-I		Submission	
			CCE-I	CCE-II (Online Test)		Exam	Journal	Case study / Educational Tour / Seminar	Day to day Perform ance
BCSE-101	Computer Organization	30	5	5	BCSE-110: LAB1- COMPUTER	30	5	5	5
BCSE-102	C Programming-I	30	5	5					
BCSE-103	Discrete Mathematical Structure	30	5	5	BCSE-111: LAB2- MATHEMATICS	30	5	5	5
BCSE-104	Computational Algebra	30	5	5					
BCSE-105	Computational Statistics-I	30	5	5	BCSE-112: LAB3- STATISTICS	30	5	5	5
BCSE-106	Statistical Methods-I	30	5	5					
BCSE-107	Electronic Fundamentals for Computer	30	5	5	BCSE-113: LAB4- ELECTRONIC S	30	5	5	5
BCSE-108	Discrete Electronics for Computer	30	5	5					
BCSE-109	English for communication-I	40	5	5					
<b>Total of SEM-I</b>	<b>TOTAL</b>	280	45	45		120	20	20	20
	<b>GRAND TOTAL</b>	<b>550</b>							

## Semester - II

Paper Code	Paper Name	SEE	Internal Exam		Subject	Practical-II		Submission	
			CCE-I	CCE-II (Online Test)		Exam	Journal	Case study/ Educational Tour/ Seminar	Day to day Performance
BCSE-201	Operating System Concepts	30	5	5	BCSE-210: LAB5-COMPUTER	30	5	5	5
BCSE-202	C Programming-II	30	5	5					
BCSE-203	Graph Theory and Algorithms	30	5	5	BCSE-211: LAB6-MATHEMATICS	30	5	5	5
BCSE-204	Computational Calculus	30	5	5					
BCSE-205	Computational Statistics-II	30	5	5	BCSE-212: LAB7-STATISTICS	30	5	5	5
BCSE-206	Statistical Methods -II	30	5	5					
BCSE-207	Electronic Circuits for Computer	30	5	5	BCSE-213: LAB8-ELECTRONICS	30	5	5	5
BCSE-208	Digital Fundamentals for Computer	30	5	5					
BCSE-209	English for communication-II	40	5	5					
<b>Total of SEM-II</b>	<b>TOTAL</b>	280	45	45		120	20	20	20
	<b>GRAND TOTAL</b>	<b>550</b>							

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**B.Sc. Computer Science (Entire) Part-I, Semester-I & II**

**Structure and Titles of Papers of Course**

**Semester-I**

<b>Sr. No.</b>	<b>Paper Code</b>	<b>Paper No.</b>	<b>Paper Name</b>
1	BCSE-101	Computer Science Paper-I	Computer Organization
2	BCSE-102	Computer Science Paper-II	C Programming-I
3	BCSE-103	Mathematics Paper-I	Discrete Mathematical Structure
4	BCSE-104	Mathematics Paper-II	Computational Algebra
5	BCSE-105	Statistics Paper-I	Computational Statistics-I
6	BCSE-106	Statistics Paper-II	Statistical Methods-I
7	BCSE-107	Electronics Paper-I	Electronic Fundamentals for Computer
8	BCSE-108	Electronics Paper-II	Discrete Electronics for Computer
9	BCSE-109	-	English for Communication-I
10	BCSE-110	-	LAB1-COMPUTER
11	BCSE-111	-	LAB2-MATHEMATICS
12	BCSE-112	-	LAB3-STATISTICS
13	BCSE-113	-	LAB4-ELECTRONICS

**Semester-II**

<b>Sr. No.</b>	<b>Paper Code</b>	<b>Paper No.</b>	<b>Paper Name</b>
1	BCSE-201	Computer Science Paper-III	Operating System Concepts
2	BCSE-202	Computer Science Paper-IV	C Programming-II
3	BCSE-203	Mathematics Paper-III	Graph Theory and Algorithms
4	BCSE-204	Mathematics Paper-IV	Computational Calculus
5	BCSE-205	Statistics Paper-III	Computational Statistics-II
6	BCSE-206	Statistics Paper-IV	Statistical Methods-II
7	BCSE-207	Electronics Paper-III	Electronic Circuits for Computer
8	BCSE-208	Electronics Paper-IV	Digital Fundamentals for Computer
9	BCSE-209	-	English for Communication-II
10	BCSE-210	-	LAB5-COMPUTER
11	BCSE-211	-	LAB6-MATHEMATICS
12	BCSE-212	-	LAB7-STATISTICS
13	BCSE-213	-	LAB8-ELECTRONICS



## B.Sc. Computer Science (Entire) Part-I, Semester-I and II

Sr. No	TEACHING SCHEME															
	Theory									Practical's						
	Subject Code		CCE		SEE		No. of lectures	Hours	Credits	SEM I	SEM II	max	min	No. of lectures	Hours	Credits
	SEM I	SEM II	max	min	max	min										
1	BCSE-101	BCSE-201	10	4	30	12	3	2.4	2	BCSE-110	BCSE-210	45	18	4	3.2	2
2	BCSE-102	BCSE-202	10	4	30	12	3	2.4	2							
3	BCSE-103	BCSE-203	10	4	30	12	3	2.4	2	BCSE-111	BCSE-211	45	18	4	3.2	2
4	BCSE-104	BCSE-204	10	4	30	12	3	2.4	2							
5	BCSE-105	BCSE-205	10	4	30	12	3	2.4	2	BCSE-112	BCSE-212	45	18	4	3.2	2
6	BCSE-106	BCSE-206	10	4	30	12	3	2.4	2							
7	BCSE-107	BCSE-207	10	4	30	12	3	2.4	2	BCSE-113	BCSE-213	45	18	4	3.2	2
8	BCSE-108	BCSE-208	10	4	30	12	3	2.4	2							
9	BCSE-109	BCSE-209	10	4	40	16	3	2.4	2	--	--	--	--	--	--	--
<b>Total</b>							<b>27</b>	<b>21.6</b>	<b>18</b>					<b>16</b>	<b>12.8</b>	<b>8</b>
<b>Sem-I &amp; II Total Marks</b>			<b>1100</b>													
<b>Total Credits</b>			<b>52</b>													

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE-101: Computer Science Paper-I: Computer Organization**

**Learning Objectives:-**

- i) To learn fundamental concepts of computers, inputs ,outputs
- ii) To learn the concepts Operating System.
- iii) To learn the principle of Office Automation.
- iv) To learn the problem solving using Computers.

**Unit –1 Introduction to Computer and Basic Organization (9)**

Introduction, Definition of computer, characteristics, Block diagram - Input Unit, Memory Unit, Output unit, Central processing unit, Limitations and Advantages of Computer, Types of Computers - Mini Computer, Micro Computer, Mainframe and Super Computers, Laptop and tablet.

Computer languages – Machine Language, Assembly Language, High Level Languages  
Translators- Assembler, Compiler and Interpreter

**Unit –2 Input, Output Devices (9)**

Introduction, Concepts of Hardware and Software, Types of Software,

Input devices: - Keyboard, Scanner, MICR, OCR,

Pointing Devices- Mouse, Joystick, Touch Screen,

Output devices: - Monitor-LCD, LED and OLED, Printers – Dot-matrix, Inkjet, Laser, Line, Plotters, CPU-Types and Working of Hardware Parts-Motherboard, Ports, HDD, SMPS

**Unit –3 Memory Concept and Computer Hardware (9)**

Memory – Primary Storage and Secondary Storage devices-

Primary Storage Devices- RAM, ROM, PROM and EPROM

Secondary Storage devices-CD, DVD, Portable Hard Disk, Pen Drive

Basic Input and Output Settings (BIOS), Network Interface Card (NIC),

Graphic Card, Network protocols-HTTP, FTP, TCP/IP.

**Unit –4 Problem Solving using Computer (9)**

Problem-Solving, Writing Simple Algorithms, Algorithms Flowcharts,

Installation of Software's, Un-installation of Software's,

Modules of Windows – Windows Explorer, Control panel, Printer Manager.

**Reference Books:-**

- 1) Computer Today –Basandara 3<sup>rd</sup> Edition (Unit 1, 2)
- 2) Fundamental of computers --V. Rajaraman.(Unit 1,2,3,4)
- 3) Computer Fundamentals --P.K. Sinha. 4<sup>th</sup>Edition (Unit 1, 2,3,4)

**Learning Outcomes:-**

- i) Understand the basic concepts of computer hardware and software
- ii) Understand the basic concepts of Input and output devises of computer system
- iii) Understand the basic concepts of Operating System and its types
- iv) Understand the basic concepts of Problem solving methods using Computer

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE-102: Computer Science Paper-II: C Programming – I**

**Learning Objectives:-**

- i. To Develop a Programming logic.
- ii. To teach basic principles of programming.
- iii. To develop skills for writing programs using 'C'.

**Unit –1 Introduction to 'C' (9)**

Algorithm, Characteristics, Flowcharts- Definition, Symbol, features, Running and debugging the program, History of 'C' , Character set and keywords , Structure of 'C' programming, Constant and its type, Basics of Linux Operating System (Ubuntu) and 'C' programming language, Introduction to GCC Compiler, VimEditor

**Unit- 2 Input-Output Statements (9)**

Variable and its Data types in 'C' Operators- Arithmetic, logical, relational, bitwise, increment, decrement, conditional, operator precedence.

Character input-output - getch(), getche(), getchar(), putchar() , String input-output - gets(), puts() Formatted input-output - printf(), scanf().

**Unit-3 Control Structures (9)**

Conditional control statements- if, if else, nested if, else if ladder, switch .

Looping – for statements, nested for, while, do-while statements, nested while and do while, Infinite loop, Unconditional breaking control statements- break, continue, goto.

**Unit-4 Arrays(9)**

Definition and declaration of array, Features of Array, Initialization of array, Memory representation of array, Types of Arrays-Single Dimensional Array, Two Dimensional Array, String functions (strcpy(), strcmp(), strcat(), strlen(), strrev()).

**Reference Books:-**

- 1) ANCI 'C' – E. Balgurusamy (Unit 1,2,3,4)
- 2)Let us C- Y. C. Kanetkar(Unit 1,2)
- 3) 'C' programming- Dennis Ritchie
- 4) Programming in C- Gottfried(Unit 1,2,3,4)
- 5) Programming in 'C'- Venugopal(Unit 1,2,3,4)
- 5) Let Us C – Yashwant Kanetkar , BPB Publications, Edition
- 6) Programming in ANSI C , E. Balagurusamy McGraw Hill Education Edition 6
- 7) Programming in C – Schuam outline Series
- 8) The C Programming Language – Brian Kernighan and Dennis Ritchie , Pearson Education India , Edition 2

**Learning Outcomes:-**

1. Illustrate the flowchart and design an algorithm for a given problem and to develop IC programs using operators
2. Develop conditional and unconditional statements to write C program.
3. Exercise user defined functions to solve real time problems.
4. Understand different concepts of Arrays.

**BCSE-110:LAB1-COMPUTER**  
**(Based on BCSE- 101 and BCSE- 102)**

**Learning Objectives:**

- i. To understand computer organization, keyboard operations , DOS Commands and Operating System concepts
- ii. To understand programming and its roles in problem solving
- iii. To understand and develop well-structured programs using C language
- iv. To develop programming skills using the fundamentals and basics of C Language.
- v. To teach the student to write algorithms and flowchart of programs in C and to solve the problems.

**Part A : (BCSE-101)**

- 1) Demonstration of Input Device.
- 2) Demonstration of Output Device
- 3) Demonstration Of Pointing Devices
- 4) Demonstration of Memory Device
- 5) Demonstration of CPU.

**Part B: (BCSE-102)**

- 1) Write a Program to convert the Temperature in centigrade degree to the Fahrenheit degree.
- 2) IF Then loop and demonstrate whether given number is even or odd.
- 3) Write a program to find out First Fifty Prime numbers.
- 4) Write a program to display Fibonacci series.
- 5) Write a program to reverse the given number.
- 6) Write a program to calculate sum and average of given n numbers using array.
- 7) Write a program to add two Matrices; Use two Dimensional array.
- 8) Write a program which display following output-  
A B C D E  
A B C D  
A B C  
A B  
A

**Learning Outcomes:-**

- i. Exercise different internal and external DOS commands.
- ii. Understand basic Structure of the C-PROGRAMMING, declaration and usage of variables.
- iii. Explain Use of conditional and iterative statements to Write C programs.
- iv. Explain Use of C programs using arrays.
- v. Explain Use of C programs using functions.

**Reference Books:**

1. Let Us C – Yashwant Kanetkar, BPB Publications, Edition 15
2. Programming in ANSI C , E. Balagurusamy McGraw Hill Education Edition 6
3. Programming in C – Schuam outline Series
4. The C Programming Language – Brian Kernighan and Dennis Ritchie , Pearson Education India , Edition 2

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE- 103: Mathematics Paper-I Discrete Mathematical Structure****Learning Objectives:-**

- i. To learn fundamental concepts Counting Principal and Recurrence relation.
- ii. To learn the concepts of Logic and Boolean Algebra
- iii. To learn the principle of Recurrence relation.
- iv. Learn above concepts with Examples.

**Unit – 1: Counting Principles (12)**

Counting: Addition & Multiplication principle, Permutation and Combination, Cardinality of finite set, Cardinality of union of sets (Addition principle), Principle of Inclusion and Exclusion. Examples Combinatorial Arguments, Pigeonhole Principle (Statement only). Examples, Linear Recurrence relation with constant coefficient, Homogeneous solutions, Particular and Total solutions

**Unit – 2: Logic (08)**

Propositions and Logical connectives: Definition, Types of Propositions, Truth values and Truth Tables, Tautology and Contradiction, Logical equivalence, Rules of inferences valid arguments and proofs, Methods of Proofs: Direct and indirect Quantifiers

**UNIT – 3 Boolean algebra (10)**

Hasse diagram Lattice: Definition, principle of duality, Basic properties of algebraic systems defined by Lattices, Distributive and complemented lattices, Boolean lattices and Boolean algebras Boolean expressions and Boolean functions, Disjunctive and conjunctive normal forms and examples. , Switching circuit

**Unit – 4: Recurrence Relations (06)**

Introduction, Linear recurrence relation with constant coefficient. Homogeneous solutions, Particular and Total solution

**Reference Books:**

1. A Text book of Discrete mathematics by S. R. Patil and others, NIRALI Prakashan (Unit- 1,Unit-2, Unit-3, Unit-4)
  2. Elements of Discrete Mathematics by C.L. Liu
  3. Discrete Mathematics by Olympia Nicodemi
  4. Discrete Mathematical Structure for Computer Science by Alan Doer and K.Levasicur.
  5. Discrete and Combinatorial Mathematics by R.m. Grassl
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6. Discrete Mathematics by Kenneth Rosen, Tata McGraw Hill
7. Discrete mathematics by Bhopatkar, Nimbkar, Joglekar, VISION Publication.
8. Discrete mathematics by Naik and Patil, PHADAKE Prakashan

**Learning Outcomes:**

**Unit 1:**

- i. Demonstrate mathematical skills, analytical and critical thinking abilities.
- ii. Demonstrate comprehension of discrete structures and their relevance within the context of computer science, in the areas of data structures and algorithms.
- iii. Apply discrete structures into other computing problems such as formal specification, verification, databases, artificial intelligence, and cryptography.

**Unit 2:**

- i) Apply formal logic proofs or informal, logical reasoning to real problems, such as predicting the behavior of software or solving problems such as puzzles.
- ii) Communicate clearly and effectively using the technical language of the field correctly.
- iii) Develop a critical appreciation of the use of information and communication technology in mathematics

**Unit 3:**

- i. Define and evaluate polynomials.
- ii. Write and interpret mathematical notation and mathematical definitions.

**Unit 4:**

- i. Students will learn: some fundamental mathematical concepts and terminology; how to use and analyse recursive definitions,
- ii. Student should know how to count some different types of discrete structures, techniques for constructing mathematical proofs mathematical concepts and principles to perform computations.

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE- 104: Mathematics Paper-I Computational Algebra**

**Learning Objectives:-**

- i. To learn fundamental concepts Relation and function with an Examples.
- ii. To learn the concepts Divisibility of integers
- iii. To learn the principle of Congruence Equation.
- iv. To learn the concepts of Groups with an examples

**UNIT – 1 Relation and Functions (12)**

Functions : Definition, Types of mapping , Injective, Surjective & Bijective functions, Inverse function, Composition of functions, Ordered pairs, Cartesian product, Relations, Types of relations, Equivalence relation, Partial ordering, Digraphs of relations, matrix representation and composition of relations, Transitive closure, Warshall's algorithm, Equivalence class, Partition of a set

**UNIT – 2 Divisibility of integers (9)**

Introduction, Divisibility : Definition and properties, Division algorithm (with proof), Greatest Common Divisor (g.c.d.), Least Common Multiple (L.C.M) ,Euclidean algorithm(Statement only) , Prime numbers, Euclides Lemma, Fundamental theorem of Arithmetic ( without proof)

**Unit – 3 Congruence Equation (7)**

Congruence relation and its properties, Fermat's Theorem (Statement only), Examples, Euler's theorem, Euler's  $\phi$  function and its properties (Statement only), Examples. Residue Classes: Definition, Examples, addition modulo n multiplication modulo n.

**UNIT – 4 Groups (8)**

Binary operation: Definition, Definition of multiplication and addition modulo, Residue classes, Semi group and Monoids: Definition and examples , Group : Definition and examples.-Simple properties of groups, Sub - Group: Definition and examples, Definition of Cyclic group and examples

**Reference Books:**

1. A Text book of Algebra and Calculus by S.R.Patil and Others NiraliPrakashan.  
(Unit- 1,Unit-2, Unit-3, Unit-4)
2. Algebra by Bhopatkar, Nimbkar, Joglekar, VISION Publication.  
(Unit- 1,Unit-2, Unit-3, Unit-4)
- 3 Algebra by Naik and Patil, PHADAKE Prakashan (Unit- 1,Unit-2, Unit-3, Unit-4)

**Learning Outcomes:**

**Unit 1:**

- i. Students will develop and apply concepts of expressions, equations and inequalities to investigate and describe relationships and solve problems.

- ii. Students will understand the basic algebraic functions in terms of fundamental concepts such as rate of change, input or output variables, domain & range, and parameters, and use multiple representations of functions.

**Unit2:**

- i. Add, subtract, multiply and divide fractions and real numbers.
- ii. Analyze and demonstrate examples of divisibility of real number.

**Unit3:**

- i. Create, use and analyze graphical representations of mathematical relationships.
- ii. Plot ordered pairs, Define properties of real numbers and use them to evaluate algebraic expressions.

**Unit4:**

- i. Analyze and demonstrate examples of subgroups, cyclic group.
- ii. Understand the use of parameters and variables, including appropriate replacement sets

**BCSE-111: LAB2-MATHEMATICS  
(Based on BCSE- 103 and BCSE- 104)**

**Learning Objectives:**

- 1. To understand Recurrence relation, Switching Circuit
- 2. To develop skills of different Algorithms with an examples
- 3. To teach the student to write theorem and its proof with an examples.
- 4. To teach principles groups with examples.

D) Student should Explain and verify

- 1. Recurrence relation with an example
- 2. Switching Circuit with an example
- 3. Combinatorial arguments with an example
- 4. Proofs of valid arguments using laws of inferences.
- 5. Representation of lattice. With an example
- 6. Euclid's algorithm, Division algorithm with an example
- 7. Fermat's theorem on remainder with an example
- 8. Warshall's algorithm with an example
- 9. Disjunctive and Conjunctive normal forms of Boolean expression with an example
- 10. Euler's  $\phi$  function with an example
- 11. Representation of relation by matrix and diagraph.
- 12. Construction of group with an example
- 13. Congruence relation with an example

**Learning Outcomes:**

- i. Understand the foundations of mathematics
- ii. Student will able to perform basic computations in higher mathematics
- iii. Student will able to read and understand middle-level proofs.
- iv. Student will able to write and understand basic proofs
- v. Develop and maintain problem-solving skills
- vi. Use mathematical ideas to model real-world problems
- vii. Acquire a knowledge of the history of mathematics
- viii. Student will able to communicate mathematical ideas with other



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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE- 105: Statistics Paper-I: Computational Statistics-I**

**Learning Objectives:-**

- i. To learn fundamental concepts of Statistics.
- ii. To learn the concepts of Data Condensation and Graphical Methods
- iii. To learn the principle of Measures of central tendency and Measures of dispersion.
- iv. To learn the concepts Moments with an examples

**Unit-1 Data Condensation and Graphical Methods: (8)**

Definition, importance, scope and limitations of statistics w.r.to computer science. Data Condensation: Raw data, Attributes and variables, discrete and Continuous variables, classification and construction of frequency distribution. , Graphical Representation: Histogram, Frequency polygon, Frequency curve, Ogive Curves and their uses, Box-Plot. Examples and problems.

**Unit-2 Measures of central tendency: (10)**

Concept of central tendency, Criteria for good measures of central tendency., Arithmetic mean: Definition, computation for ungrouped and grouped data, combined mean, weighted mean, merits and demerits., Median: Definition, formula for computation for ungrouped and grouped data, graphical method, merits and demerits., Mode: Definition, formula for computing for ungrouped and grouped data, merits and demerits, Quantiles: Definition, formula for computation for ungrouped and grouped data, graphical method., Numerical problems.

**Unit-3 Measures of Dispersion: (10)**

Concept of dispersion and measures of dispersion, absolute and relative measures of dispersion, Range and Quartile Deviation: definition for ungrouped and grouped data and their coefficients, merits and demerits, Mean Deviation: definition for ungrouped and grouped data, minimal property (statement only). , Standard deviation and Variance: definition for ungrouped and grouped data, coefficient of variation, combined variance and s.d. for two groups, merits and demerits. , Numerical problems

**Unit-4 Moments : (8)**

Raw and central moments: definition for ungrouped and grouped data (only first four moments), relation between central and raw moments (statement only), Sheppard's Correction., Measures of skewness: Types of skewness, Pearson's and Bowley's coefficient of skewness, Measures of skewness based on moments., Measures of Kurtosis: Types of kurtosis, Measures of kurtosis based on moments., Numerical problems.

**Reference Books:-**

1. Fundamentals of Statistics by Goon, Gupta, Das Gupta.(Unit-1,2,3,4)
2. Fundamental of Statistics by S. C. Gupta.(Unit-1,2,3,4)
3. Complete Business Statistics by Amir D. Aczel, JayalSounderpandian.(Unit-1,2,3,4)
4. Fundamental of Statistics by D. N. Elhance, B. M. Agarwal.(Unit-1,2,3,4)

5. Basic Statistics by B. L. Agarwal.(Unit-1,2,3,4)
6. Statistical Methods by S. P. Gupta.(Unit-1,2,3,4)
7. Fundamental of Mathematical Statistics by Gupta and Kapoor.(Unit-1,2,3,4)

**Learning Outcomes:**

**Unit1:**

- i) To construct the data.
- ii) To classify and tabulate the data.
- iii) To summarize large data.
- iv) To demonstrate classified and tabulated data.
- v) To draw and interpreted various graphs and diagrams.

**Unit2:**

- i) To define mean, median, mode etc.
- ii) To compute and interpret measures of central tendency.
- iii) To analyses and interpreted the data.

**Unit3:**

- i) To define S.D., variance etc.
- ii) To compute and interpret measures of dispersion.
- iii) To analyses and interpreted the data.

**Unit4:**

- i) To define moment, Skewness etc.
- ii) To compute and interpret skewness and kurtosis.
- iii) To analyses and interpreted the data.
- iv) To demonstrate the shape, size and height of data.

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE- 106: Statistics Paper-II: Statistical Methods-I**

**Learning Objectives:-**

- i. To learn fundamental concepts Probability with an examples.
- ii. To learn the Theorems on probability
- iii. To learn the types of probability.
- iv. To learn the concepts of standard discrete probability distributions

**Unit-1 Probability: (9)**

Idea of permutation and combination, concept of experiments and random experiments., Definitions: sample space, discrete sample space, continuous sample space, events, types of events, power set (sample space consisting at most 3 sample points). ,Illustrative examples., Classical (apriori) definition of probability of an event, equiprobable sample space, simple examples of probability of an events based on permutations and combinations, axiomatic definition of probability., Theorems on probability: i)  $P(\Phi) = 0$  , ii)  $P(A') = 1 - P(A)$  , iii)  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$  , iv) If  $A \subseteq B$ ,  $P(A) \leq P(B)$  , v)  $0 \leq P(A \cap B) \leq P(A) \leq P(A \cup B) \leq P(A) + P(B)$ , Illustrative examples.

**Unit-2 Conditional probability and independence of events: (10)**

Definition of conditional probability of an event, examples., Partition of sample space, Baye's theorem (only statement), concept of prior and posterior probability and examples., Concept of independence of two events, examples., Proof of the result that if A and B are independent events then i) A and B', ii) A' and B, iii) A' and B' are also independent., Pairwise and complete independence of three events, examples. Elementary examples.

**Unit-3 Univariate probability distributions: (9)**

Definitions: discrete random variable, probability mass function (p.m.f.), cumulative distribution function (c.d.f.), properties of c.d.f., median, mode, p.g.f. and examples., Definition of expectation of a random variable, expectation of a function of random variable, variance. Results on expectation :i)  $E(c) = c$ , where c is constant. ii)  $E(aX + b) = a E(X) + b$ , where a and b are the constants., Examples.

**Unit-4 Some standard discrete probability distributions: (8)**

Discrete uniform distribution: p.m.f., mean and variance, examples, Binomial distribution: p.m.f., mean and variance, additive property of binomial variates, recurrence relation for probabilities, examples., Poisson distribution: p.m.f., mean and variance, additive property, recurrence relation for probabilities, Poisson distribution as a limiting case of binomial distribution (without proof), examples.

**Reference Books:-**

1. Modern Mathematical Statistics by Edward J. Dudewicz, Satya N. Mishra.(Unit-1,2,3)
2. Fundamentals of Statistics by S. C. Gupta.(Unit-1,2,3,4)
3. Complete Business Statistics by Amir D. Aczel, Jayal Sounderpandian.(Unit-1,2,3,4)
4. Fundamental of Statistics by D. N. Elhance, B. M. Agarwal.(Unit-1,2,4)

5. Basic Statistics by B. L. Agarwal.(Unit-1,2,3,4)
6. Statistical Methods by S. P. Gupta.(Unit-1,2,3,4)
7. Fundamental of mathematical statistics by Gupta and Kapoor.(Unit-1,2,3,4)
8. Mathematical Statistics by J.E. Freund.(Unit-1,2,3)

**Learning Outcomes:**

**Unit1:**

- i) To classify and tabulate the data.
- ii) To define sample space, event, probability etc.
- iii) To compute probabilities by using definition and probability rules.

**Unit2:**

- i) To classify and tabulate the data.
- ii) To define probability, conditional probability, independent event etc.
- iii) To compute conditional probabilities by using definition and probability rules.

**Unit3:**

- i. To define random variable, p.m.f., distribution functions etc.
- ii. To explain mean, median, mode.
- iii. To compute mean, mode, median etc.

**Unit4:**

- i) To compute and interpret statistical distributions.
- ii) To draw and interpreted the shape of discrete probability distributions.
- iii) To explain various discrete distributions.
- iv) To analyses and interpreted the data.
- v) To compute probabilities by using discrete probability distributions.
- vi) To fit various statistical distributions.
- vii) To draw and analyses model sample for various distributions.

**BCSE-112: LAB3-STATISTICS**  
**(Based on BCSE- 105 and BCSE- 106)**

**Learning Objectives:**

- i) To construct the data.
- ii) To Understand the Graphical representation, Measures of central tendency and dispersion
- iii) Student will able to perform computations for Moments of Skewness and Kurtosis
- iv) To Understand the Probability different distributions.

- 1) Construction of frequency distributions.
- 2) Graphical Representation.
- 3) Measures of Central tendency (Ungrouped data).
- 4) Measures of Central tendency (Grouped data).
- 5) Measures of dispersion (Ungrouped data).
- 6) Measures of dispersion (Grouped data).
- 7) Moments, Skewness and Kurtosis (Ungrouped data).
- 8) Moments, Skewness and Kurtosis (Grouped data).
- 9) Computation of probability.
- 10) Computation of Conditional probability.
- 11) Computation of probability on Baye's Theorem.
- 12) Fitting of Binomial distribution.
- 13) Fitting of Poisson distribution.
- 14) Model sampling from Binomial distribution.

15) Model sampling from Poisson distribution.

**Learning Outcomes:**

- i) To construct data.
- ii) To draw and interpreted the graphs and diagrams.
- iii) To analyses and interpreted the data by various statistical techniques.
- iv) To compute probabilities.
- v) To fit various statistical distributions.
- vi) To draw and analyses model sample for various distributions.
- vii) To draw and interpreted the shape of discrete probability distributions.
- viii) To exhibit critical and creative thinking skills for analysis and evaluation of problems.
- ix) To demonstrate MS-Excel

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**B.Sc. Computer Science (Entire) Part-I Semester- I**  
**BCSE- 107: Electronics Paper-I: Electronic Fundamentals for Computer**

**Learning objectives:-**

- i. It presents the principle of circuit analysis and design.
- ii. To learn the basic concepts and characteristics of electronic devices and circuits.
- iii. To understand AC sources, DC sources and their concept.
- iv. To verify the theoretical concept through laboratory and simulation experiment.

**Unit I: Basic Electricals (9)**

AC Sources, Concept of Single Phase, Three phase Power Supplies, RMS Value, Power Calculations, Fuses and protection circuits (MCB), Earthing, Cable (Types of Cables) DC Sources, Types of batteries, battery rating, charging.

**Unit II: Discrete Components in Computer (9)**

Resistor, Capacitor, Inductor

Resistor: Classification, Construction of Carbon Composition Resistor, Color Code, Specification of Resistor.

Capacitor: Classification, Construction of Electrolytic Capacitor only, Specification of Capacitor.

Inductor: Types of Inductor, Uses.

Transformer: Types of transformers, Construction of Step down transformer and its Specifications.

**Unit-III Theorems (9)**

Ohm's Law, Kirchhoff's Law, Applications of Kirchhoff's Law, Thevenin's theorem, Superposition Theorem, Norton Theorem, Maximum Power Transfer Theorem

**Unit-IV Types of Motors**

DC Motor, Brushless Motor, Stepper Motor, Servomotor, AC Motor, H- B

(9)

**Reference Books:**

1. A text of Applied Electronics, R. S. Sedha, S Chand Publication (Unit 1 & Unit 2)
2. Basic Electronics and linear circuits: N. N. Bhargava, D. C. Kulshreshtra, S. C. Gupta, Tata McGraw Hill Publication (Unit 1 & Unit 3 )
3. Electronic Devices and Circuits: Boyistead, Tata McGraw Hill ( Unit 1 & Unit 4)
4. Principle of electronics: V.K. Mehta, S. Chand and Company Ltd. 5<sup>th</sup> Edition a. (Unit 1,2,4)

**Learning outcomes:-**

**Unit 1:**

- i. Understand the basic concepts of AC and DC Sources.
  - ii. Explain the concept of Single phase & three phase power Supplies
  - iii. Define the concept of Fuses and protection circuits.
-

- iv. Design the circuit analysis for power supply.

**Unit 2:**

- i. Understand the basic discrete Components in Computer.
- ii. Understand the different types of resistors and its construction.
- iii. Understand the different types of Capacitors and its construction.
- iv. Understand the different types of Inductors and its construction.
- v. Explain the concept of types of transformers and its construction.

**Unit 3:**

- i. Define the Network Theorem.
- ii. Explain the concept of electrical network topology nodes ,branch,loops to solve the circuit problems.
- iii. Verify the Thevenin's theorem and Kirchoff's Law, etc.
- iv. Explain the concept of Ohm's Law

**Unit 4:**

- i. Explain the basic concept of Motor.
- ii. Define the types of Motors.
- iii. Understand the concept of H-Bridge.
- iv. Demonstrate the DC motor Concept.

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**B.Sc. Computer Science (Entire) Part-I Semester- I  
BCSE- 108: Electronics Paper-II: Discrete Electronics for Computer**

**Learning objectives:-**

- i. To understand the basic electronic components like resistor active and passive component
- ii. To observe the characteristics of diode like p-n junction, zener diode
- iii. To observe the characteristics transistor, thyristor
- iv.v. To understand the fabrication of electronic component Resistor, Capacitor, etc

**Unit I: Diodes (9)**

P-N junction Diode, Zener Diode, Schottkey Diode, LED, Photodiode.

**Unit II: Electronic Devices (9)**

Transistors: BJT, FET, MOSFET, UJT.  
Thyristor: SCR, TRIAC, DIAC.

**Unit III: Audio, Video I/Os (9)**

Bar Chart, Seven Segment Display, Dot Matrix Display, LCD, Optocoupler, Speaker, MIC, Buzzer

**Unit IV: Fabrication Steps and Materials (9)**

Fabrication of Electronic Components: Resistor, Capacitor, Diode, Transistor (NPN, PNP), P- Channel and N- Channel MOSFET.

**Reference Books:**

1. A text of Applied Electronics, R. S. Sedha, S Chand Publication (Unit 1 & Unit 2)
2. Basic Electronics and linear circuits: N. N. Bhargava, D.C. Kulshreshtra, S. C. Gupta, Tata McGraw Hill Publication (Unit 3 )
3. Electronic Devices and Circuits: Boyistead, Tata McGraw Hill (Unit 1 & Unit 3)
4. Power Electronics, techmax publications by J.S.Katre (Unit 2 & Unit 4)

**Learning outcomes:-****Unit 1:**

- i. Explain the basic concept of semiconductor diode .
- ii. Define P-N Diode and schottkey Diode.
- iii. Explain the Concept of Zener Diode and their characteristics.
- iv. Verify the characteristics of Diodes.

**Unit 2:**

- i. Understand the basic concept of transistors used in computer system.
- ii. Explain the structure of transistors.
- iii. Analyze the concept of SCR and observe its characteristics.
- iv. Analyze and design the basic operation of TRIAC.

**Unit 3:**

- i. Understand the basic concept of bar chart and seven segments Display.
- ii. Define Common anode and common cathode concept.
- iii. Explain the construction of LCD and OptoCoupler.
- iv. Explain the concept of Transducers.

**Unit 4:**

- i. Design and analyze the basic operation of MOSFET.
- ii. Understand the fabrication of basic electronic components.
- iii. Demonstrate resistor fabrication.

**BCSE-113: LAB4-ELECTRONICS**  
**(Based on BCSE- 107 and BCSE- 108)**

**Learning objectives:-**

- i. To understand the basic electronic components like resister active and passive component
  - ii. To verify the different theorems.
  - iii. To observe the characteristics of HWR, FWR, PN, FET, UJT etc.
  - iv. To understand the PCB Designing Software
1. Study of Electronics components
  2. Study of CRO
  3. Verification of Kirchoff's Law
  4. Verification of Thevenin's Theorem
  5. Verification of Norton's Theorem
  6. Study of Full wave Rectifier
  7. Study of Half wave Rectifier
  8. Study of PN junction Diode
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9. Study of FET Characteristics
10. Study of Transistor as a switch
11. Study of SCR Firing using UJT
12. Study of PCB Designing using Software
13. Study of Phase shift control of SCR
14. Study of Zener diode as voltage regulator

**Learning outcomes:-**

- i. To identify the basic electronic component
- ii. To study the operations of multi-meter(Analog & digital) ,function generator, regulator power supply and CRO
- iii. To verify Thevenin's Theorem, Norton's Theorem
- iv. To understand and demonstration of PN junction Diode, Zener diode as voltage regulator etc.

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**B.Sc. Computer Science (Entire) Part-I Semester- I**

**BCSE- 109: English for communication -I**

**Learning Objectives:**

1. To acquaint students with communication skills.
2. To inculcate human values among the students through poems and prose.
3. To improve the language and business competence of the students.

**Module I:** A. Communication and its types  
B. Technology with a Human Face – E.F. Schumacher  
C. How Beautiful - P. K. Padhy

**Module II:** A. Developing Vocabulary  
B.As a Flower I Come - by Sundaram

**Module III:** A. Expansion of Ideas  
B.I Have a Dream - Martin Luther King

**Module IV:** A. The Auspicious Vision- Tagore  
B. The Book - Iftikar Rizvi

**Course Outcomes:**

1. The prescribed course equips students with nuances of language that includes proficiency in grammar, its effective usage in speaking and writing. It also develops their personality.  
→ It further helps them to prepare for various competitive exams and to keep up with the increasing demand of English in Indian society.

2. Vocabulary improves their communication and writing skills, and at the same time equipping them to use modern forms of communication. Elective English (BA) – The study of elective subject of English.

**Reference Books:**

1. Shivaji University, Kolhapur, B.Sc. Part I (AECC) Compulsory English(CBCS)

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE-201: Computer Science  
Paper-III: Operating System Concepts**

**Learning Objectives:-**

- i. To learn fundamental concepts of Network Basic Concepts
- ii. To learn the concepts Operating System.
- iii. To learn the principle of Office Automation.
- iv. To learn the problem solving using Computers.

**Unit -1:Operating System concepts (09)**

Definition and Functions of O.S.,Types of O.S. –Single user, Multiuser.

Process Management-Multiprogramming, Multitasking, Multiprocessing, Time sharing.

Disk Operating System (DOS), Booting Processes , DOS commands, concept of directory and file.

Windows Operating system : Features of Windows O.S.

Open Source Operating System- Linux/Ubuntu

**Unit -2:Open Source Operating System ( Ubuntu /Linux) (09)**

Introduction to Linux, Comparison of Linux with Windows operating system.

Architecture of Linux, Login, Logout, Shell, Kernel, GPU Commands (cal, date, who etc.)

Directory management(mkdir, cd, rmdir), File handling using Linux commands,

commands –ls, cat,cp,mv,rm ,Types of files,chmod command,

Basic filter- head, tail,sort,grep.

**Unit – 3: Shell Programming (10)**

Introduction, Creating files using VI editor, Handling command mode, insert mode and ex Mode, Concept of Shell scripting, Conditional statements-if, if else, case.

Looping-for, while, until, Continue and break statement, read, echo statement,

Writing and executing shell script

**Unit – 4: Internet Concepts (08)**

Introduction of Internet,History of Internet,Uses and benefits, Introduction to different Web

Browsers, Internet Protocol(SMTP,POP,IMAP),Concept of Email, Working with Email(Compose email, Send email, File Attachment, Uploading and Downloading )

**Reference Books:-**

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- 1) Web Publishing- Monica D'Souza & Jude D'Souza (BPB)(Unit 4)
- 2) MS-Office Reference Book(Unit 2)
- 3) Introduction to Computer and Data Processing- Pawar, Lad, Shinde, Patil (Dreamtech) (Unit 1, 2, 3, 4)

**Learning Outcomes:-**

- i) Understand the basics concepts of computer networks.
- ii) Study different MSOffice/Open Source Word Tools.
- iii) Study different MSOffice/Open Source Excel Tools.
- iv) Study different MSOffice/Open Source PowerPoint Tools.

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE-202: Computer Science Paper-IV: C Programming–II**

**Learning Objectives:-**

- i. To Develop a Programming logic.
- ii. To teach basic principles of programming.
- iii. To develop skills for writing programs using 'C'.

**Unit- 1 Functions (9)**

Definition, declaration, prototype of function, Local and global variable, User defined functions

Storage classes, Recursion, Call by value and Call by reference, Preprocessor

**Unit-2 Pointers (09)**

Definition and declaration, Operations on pointer , Pointer initialization , Pointer And Function, Pointer And Array, Pointer of pointer, Dynamic memory allocation

**Unit-3 Structures and Union (09)**

Definition and declaration, Array of structures, Passing structure to function, Pointer to structure , Nested structure, self-referential structure, Size of and typedef , Definition of Union and declaration, Difference between structure and Union

**Unit-4 File Handling (09)**

Concept of File ,Text and binary files, Opening and closing files., File opening mode- read, write, append , Character and integer handling ( getc() , putc() , getw() , putw() ) ,Formatted input- scanf(), sscanf(), fscanf(), fread(), Formatted output- printf(), sprintf(), fprintf(), fwrite()

Functions- fseek(), ftell(), fflush(), fclose(), fopen(), rewind()

**Reference Books:-**

- 1) ANCI 'C' – E. Balgurusamy (Unit 1, 2, 3, 4)
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- 2) Let us C- Y. C. Kanetkar (Unit 1,2)
- 3) 'C' programming- Dennis Ritchie
- 4) Programming in C- Gottfried (Unit 1,2,3,4)
- 5) Programming in 'C'- Venugopal (Unit 1,2,3,4)

### **Learning Outcomes:-**

#### **Unit1:**

- i. Study different basic concepts pointers in C
- ii. Understand the different concepts of operations on Pointers.
- iii. Describe C programs that use Pointers to access arrays and functions.
- iv. Describe C programs using pointers and to allocate memory using dynamic memory management functions.

### **BCSE-210: LAB5-COMPUTER (Based on BCSE-201 and BCSE-202)**

#### **Learning Objectives:**

- i. To understand computer programming and its roles in problem solving
- ii. To understand and develop well-structured programs using C language
- iii. To develop programming skills using the fundamentals and basics of C Language.
- iv. To teach the student to write algorithms and flowchart of programs in C and to solve the problems.
- v. To teach the student MS-Access and its concepts to database management.

#### **Part A: (BCSE-201)**

1. Starting and Stopping Linux: Booting a Linux System, Shutting Down a Linux System,.
2. Demonstration of Linux commands with attributes: - pwd, cd, ls, echo, clear, kill, ps, man, cal, date, who, who am I, wc, mkdir, rmdir, rm, sort.
3. Creation of Files, and changing their permission using chmod command.
4. Write a shell script which check given number is prime or not.
5. Write a shell script to modify "cal" command to display calendars of the specified range of months.
6. Write a shell script which display date in the mm/dd/yy format.
7. Write a shell script which check given number is positive or not.
8. Write a shell script to find the sum of digits of a given number.
9. Write a shell script to find the factorial of a given number.
10. Create your E-Mail ID and send an E-mail
11. Login through your E-Mail ID and do the following: Read your mail Compose a new Mail, Send the Mail to one person, Send the same Mail to various persons, Forward the Mail, Delete the Mail, Send file as attachment

#### **Part B : (BCSE-202)**

- 1) Student should explain program to reverse string using Pointer.
- 2) Student should demonstrate a program that accepts the Roll No, Name, Marks obtained in three tests of 'N' students & display the total and Average in tabular format.
- 3) Student should Write a program to separate even and odd numbers available in input file.
- 4) Student should Write a program to count the no. of words in a given text file.
- 5) Write a program which swap two number using call by reference.
- 6) Write a program to find given string is Palindrome or not using function.

**Learning Outcomes:-**

- i. Exercise MS Word, MS PowerPoint and
- ii. Use various operations using Internet in detail.
- iii. Write C programs using Pointers to access arrays, strings and functions.
- iv. Write C programs using file functions and Graphics functions.

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**B.Sc. Computer Science (Entire) Part-I: Semester- II  
BCSE- 203: Mathematics Paper-III: Graph Theory and Algorithms**

**Learning Objectives:**

- i. To understand the concepts of Graphs and operations on graphs with an examples
- ii. To understand the concepts of Tree graphs and directed graphs with an examples

**Unit – 1: Graphs and operations on graphs (10)**

Definition and elementary results, Types of graphs, Isomorphism, Matrix representation of graphs: Adjacency matrix and incidence matrix, Sub graphs and induced graphs Complement of a graph, Self complementary graphs, Union, intersection of graphs, Ring sum of two graphs

**Unit – 2 Connected Graphs (8)**

Definitions: walk, trail, tour, path and circuit, Definitions of connected, disconnected graphs, Dijkstra's shortest path algorithm, Definition of Euler's and Hamilton Graph and Example.

**Unit-3 : Tree Graphs (8)**

Tree: Definition, 1 Theorem: A tree with  $n$  vertices has  $n - 1$  edges. 2 Theorem: A Connected graph  $G$  with  $n$  vertices and  $n - 1$ , edges is a tree, 3 Theorem: A graph with  $n$  Vertices is a tree if and only if it is circuit free and has  $n - 1$  edges., 4 Theorem : A graph  $G$  is a tree if and only if it is minimally connected., Center of a tree, Spanning tree: Definition and examples, Fundamental circuit and cut – set : Definition, Binary trees and elementary results, Kruskal's algorithm.

**Unit - 4 : Directed Graphs (10)**

Definition, types of directed graphs, Directed (rooted) trees, arborescence and Polish notation, Isomorphism of digraphs, Connectedness in digraphs, Euler digraph, Network and flows: Definition, examples, Maximal flow algorithm.

**Reference Books:**

1. A Text book of Discrete mathematics by S.R.Patil and others, NIRALI Prakashan (Unit- 1, Unit-2, Unit-3, Unit-4)
  2. Elements of Discrete Mathematics by C.L. Liu (Unit-2)
  3. Discrete Mathematics by Olympica Nicodemi
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4. Discrete Mathematical Structure for Computer Science by Alan Doer and K.Levasicur.
5. Discrete and Combinatorial Mathematics by R.m. Grassl
6. Discrete Mathematics by Kenneth Rosen,Tata McGraw Hill
7. Graph Theory with Applications to Computer Science and Engineering by
8. A First Step in Graph Theory by Raghunathan, Nimkar and Solapurkar
9. Discrete mathematics by Bhopatkar, Nimbkar, Joglekar,  
VISION Publication.
10. Discrete mathematics by Naik and Patil, PHADAKE Prakashan

**Learning Outcomes:**

**Unit 1:**

- i. Student able to formulate problems in terms of graphs, solve graph theoretic problems.
- ii. To understand the concepts of Graph and types of graphs

**Unit 2:**

- i. Use mathematical definitions to identify and construct examples and to distinguish examples.
- ii. To understand the concepts of
- iii.
- iv. problem solving methods using algorithms of graphs

**Unit 3:**

- i. Solve problems using basic graph theory
- ii. To understand the concepts of

**Unit 4:**

- iii. Solve problems involving vertex and edge.
- iv. Determine whether graphs are Hamiltonian and/or Eulerian

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE- 204: Mathematics Paper-IV: Computational Calculus**

**Learning Objectives:**

- i. To understand the concepts of Successive differentiation
- ii. To teach the student continuity and Mean value theorem
- iii. To understand Sequences and series of real numbers

**UNIT-1 Successive Differentiation (6)**

$n^{\text{th}}$  derivatives of some standard functions., Leibnitz's Theorem ( with proof) and examples.  
L'Hospital's Rule (without proof) and examples

**UNIT-2 Continuity and Mean value Theorems (11)**

Continuity of a function and its properties defined on  $[a,b]$ , (Properties without proof)  
 Differentiability. Differentiability implies continuity but not conversely. ,Rolle's theorem(with proof ) and its geometric significance and examples, Lagrange's Mean Value theorem(with proof) and its geometric, significance and examples., Cauchy's Mean Value theorem (with proof) and examples., Taylor's and Maclaurin's Theorems (without proof) Taylor's and Maclaurin's series, Series expansions of  $e^x$ ,  $\sin x$ ,  $\cos x$ ,  $\log(1 + x)$  etc.

### UNIT – 3 Sequences of real numbers (09)

Sequences of real numbers: Definition, examples, Convergent, divergent, oscillatory sequences, Bounded sequence: Definition and examples, Monotonic sequences. Theorems on monotonic and bounded sequences(statements only), Show that sequence  $\langle (1+1/n)^n \rangle$  is convergent and its limit is ' e '., Convergence of sequence  $\langle x^n \rangle$ , where  $x \in \mathbb{R}$ ,  $0 < x < 1$

### UNIT – 4 Series of real numbers (10)

Partial sums, Convergent, Divergent series. Definition and examples, Convergence of geometric series (with proof)., Comparison Test and its limit form (for the series of positive terms), Convergence of p – series ( without proof)., D-Alembert's Ratio Test (statement only) and examples., Root Test (statement only) and examples.

### Reference Books:

1. A Text book of Algebra and Calculus by S.R.Patil and Others NiraliPrakashan. (Unit- 1,Unit-2, Unit-3, Unit-4)
2. Calculus by Dr. S.B. Nimse (Unit- 1,Unit-2, Unit-3, Unit-4)
3. Mathematical Analysis : Malik and Arrora
4. Real Analysis by R.G. Bartle,D.Sherbert, 3rd Edn, John Wiley & Sons,
5. Differential Calculus by Shanti Narayan, S.Chand& Co.
6. A text book of Calculus and Differential equations by Dinde H. T. ,Lokhande A.D.etc. SUMS publication.

### Learning Outcomes:

#### Unit1:

- i. Compute limits, derivatives of algebraic, trigonometric, piece-wise defined functions, logarithmic and exponential functions.

#### Unit2:

- i. Apply the Fundamental Theorem of Calculus.

#### Unit3:

- i. Determine the continuity and differentiability of a function at a point and on a set

#### Unit4:

- i) Define the concepts of sequence and series, and determine limits of sequences and convergence of sequence and series.

### BCSE-211: LAB6-MATHEMATICS (Based on BCSE-203 and BCSE-204)

I) Student should explain and verify

1. Kruskal's algorithm with example
2. Dijkstra's Shortest path algorithm with example
3. Fundamental circuit and fundamental cut set with example
4. Polish prefix, Postfix, notations, arborescence with example
5. Ford Fulkerson Algorithm with example

- 6 Program on Ford Fulkerson Algorithm with an example
7. Program on Shortest path Algorithm with an example.
8. Program on Shortest path Algorithm with an example.
9. Rolle's Theorem with an example
10. Lagrange's Mean Value Theorem with an example
11. Cauchy's Mean Value Theorem with an example
12. Series expansion of  $\log(1+x)$ ,  $e^x$ ,  $\sin x$ ,  $\cos x$ ,  $(1+x)^n$
13. L'Hospital's Rule with an example
14. Leibnitz's Rule with an example
15. Convergence of monotonic sequence with an example

**Learning Outcomes:**

- i. 1. Students will be able to model and solve real-world problems using graphs and trees, both quantitatively and qualitatively.
- ii. Apply mathematics to solve problems.
- iii. Solve problems of rounding to the nearest whole number, place of decimal, cent, metre, kilogram etc.
- iv. Apply methods of counting and tallying in practical situations 3. operate a calculator to solve problems



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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE- 205: Statistics Paper-III: Computational Statistics-II**

**Learning Objectives:-**

- i. To learn fundamental concepts of Correlation and Regression with an examples.
- ii. To learn the Multiple Regression and Partial Correlation with an examples

**Unit-1 Correlation (for ungrouped data): (12)**

Concept of bivariate data, scatter diagram. Concept of correlation, positive correlation, negative correlation, cause and effect relation., Karl Pearson's coefficient of correlation, Properties of correlation coefficient, interpretation of correlation coefficient., Spearman's Rank Correlation coefficient ( formula with and without ties)., Numerical problems.

**Unit-2 Regression (for ungrouped data):(10)**

Concept of regression. Derivation of lines of regression by method of least squares., Regression Coefficients and their significance. Properties of regression coefficients. Point of intersection and acute angle between regression lines (without proof)., Numerical problems.

**Unit-3 Multiple Regression (For Trivariate Data):(15)**

Concept of multiple regressions. Yule's Notations., Residual: definition, order, properties, mean and variance of residual. , Fitting of multiple regression planes. Partial regression coefficients, interpretations., Numerical Problems.

**Unit-4 Multiple and Partial Correlation (For Trivariate Data):(12)**

Concept of multiple correlation. Definition of multiple correlation coefficients and its formula., Properties of multiple correlation coefficients (Statements only)., Interpretation of multiple correlation coefficient when it is equal to zero and one., Concept of partial correlation. Definition of partial correlation coefficients and its formula., Properties of partial correlation coefficients (Statement only). , Examples and Problems.

**Reference Books:-**

1. Fundamentals of Statistics by S. C. Gupta.(Unit-1,2)
2. Complete Business Statistics by Amir D. Aczel, JayalSounderpandian.(Unit-1,3)
3. Fundamental of Statistics by D. N. Elhance, B. M. Agarwal.(Unit-1,2)
4. Mathematical Statistics by J.E. Freund.(Unit-1,2)
5. Basic Statistics by B. L. Agarwal.(Unit-1,2)
6. Mathematical Statistics by J. N. Kapur, H. C. Saxena.(Unit-3)
7. Statistics by D. N. Sancheti, V. K. Kapoor.(Unit-1,2,3,4)

**Learning Outcomes:**

**Unit1:**

- i. To compute relation between two variables.
- ii. To define correlation, types of correlation methods of correlation etc.
- iii. To compute and interpret correlation, methods of correlation etc.
- iv. To analyses and interpreted the data.

**Unit2:**

- i. To compute relation among three variables.
- ii. To define regression, lines of regression etc.
- iii. To fit lines of regression by method of least square
- iv. To analyses and interpreted the data.

**Unit3:**

- i. To define multiple regression.
- ii. To fit plane of multiple of regression.
- iii. To analyses and interpreted the data.

**Unit4:**

- i. To define partial correlation, multiple correlation etc.
- ii. To compute and interpret partial and multiple correlation
- iii. To analyses and interpreted the data.

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE- 206: Statistics Paper-IV: Statistical Methods-II****Learning Objectives:-**

- i. To learn concepts of Continuous Univariate Distributions.
- ii. To learn the Exact sampling distributions with an examples
- iii. To learn the Test of Hypothesis and Simulation with an examples

**Unit-1 Continuous Univariate Distributions : ( 15)**

Definitions: continuous random variable, probability density function ( p.d.f. ), cumulative distribution function (c.d.f.), properties of c.d.f. , Expectation of random variable, expectation of function of a random variable, variance, m.g.f. and examples.

Uniform distribution: p.d.f., c.d.f., mean, variance and examples. ,Exponential , istribution: p.d.f., c.d.f., mean, variance, lack of memory property and examples., Normal distribution: p.d.f., standard normal distribution, properties of normal curve, distribution of  $aX+bY$ , where X and Y are independent normal variates, normal distribution as a limiting case of Binomial and Poisson distributions (without proof), examples.

**Unit-2 Exact sampling distributions :(12)**

Chi-square distribution: definition, chi-square variate as the sum of square of i.i.d. , S.N.V., statement of p.d.f., mean , variance, additive property, approximation to normal distribution and examples. , Student's t distribution: definition, nature of probability curve, statement of mean and variance, approximation to normal, examples.,Snedecor's F- distribution: definition, mean and variance, inter-relationships between chi- square, t and F distributions, examples.

**Unit-3 Test of Hypothesis:(10)**

Definitions: random samples, parameter, statistic, standard error of a statistic., Concept of null and alternative hypothesis, types of error, critical region, level of significance, one sided and two sided tests, general procedure of testing of hypothesis., Large sample tests:

i) population mean ii) equality of population mean iii) population proportion.

Small sample tests: i) test for population variance, Chi-square test for goodness of fit and test for independence of attributes using  $2 \times 2$  contingency table.

ii) t-test for testing population mean, equality of population mean and Paired t-test.

iii) F-test for equality of two population variances.,

Examples.

#### **Unit-4 Simulation :(8)**

Introduction to simulation, merits and demerits, Pseudo-random number generator, model sampling from uniform and exponential distribution. Model sampling from normal distribution using Box-Muller transformation. Examples.

#### **Reference Books:-**

1. Fundamentals of Statistics by S. C. Gupta.(Unit-3)
2. Modern Mathematical Statistics by Edward J. Dudewicz, Satya N. Mishra. (Unit-1,3)
3. Fundamental of Statistics by D. N. Elhance, B. M. Agarwal.(Unit-3)
4. Mathematical Statistics by J.E. Freund.(Unit-3)
5. Basic Statistics by B. L. Agarwal.(Unit-1,2,3)
6. Fundamental of Statistics by Gupta and Kapoor.(Unit-1,2,3)
7. Statistics by V. K. Kapoor.(Unit-1,2,3)

#### **Learning outcomes:**

##### **Unit1:**

- i. To define continuous random variable, p.d.f., distribution functions etc.
- ii. To compute and interpret statistical distributions.
- iii. To draw and interpreted the shape of continuous probability distributions.
- iv. To explain various continuous distributions.
- v. To analyses and interpreted the data.
- vi. To compute probabilities by using continuous probability distributions.
- vii. To fit various statistical distributions.
- viii. To draw and analyses model sample for various distributions.

##### **Unit2:**

- i. To compute and interpret statistical distributions.
- ii. To draw and interpreted the shape of continuous probability distributions.
- iii. To explain various continuous distributions.
- iv. To analyses and interpreted the data.
- v. To compute probabilities by using continuous probability distributions.
- vi. To fit various statistical distributions.
- vii. To draw and analyses model sample for various distributions.
- viii. To draw and interpreted the shape of continuous probability distributions

##### **Unit3:**

- i. To define statistic, parameter, test statistic etc.
- ii. To explain procedure of testing of hypothesis.
- iii. To explain the small sample and large sample tests in various situations
- iv. To compute the small sample and large sample tests in various situations

##### **Unit4:**

- i. To analyses and interpreted the data.

- ii. To fit various statistical distributions.
- iii. To draw and analyses model sample for various distributions.
- iv. To Simulation study of various distributions.

**BCSE-212: LAB7-STATISTICS**  
**(Based on BCSE-205 and BCSE-206)**

**Learning Objectives:**

- i) To understand the Computation of correlation, Fitting of different distribution
  - ii) To understand the Computation of partial correlation coefficients
  - iii) To verify different Model sampling
  - iv) To understand Computation on different tests
- 
- 1) Computation of correlation coefficient and scatter diagram.
  - 2) Fitting of lines of regression (Ungrouped data).
  - 3) Fitting of regression planes and estimation.
  - 4) Computation of partial correlation coefficients.
  - 5) Computation of multiple correlation coefficients.
  - 6) Fitting of Uniform distribution.
  - 7) Fitting of Exponential distribution.
  - 8) Fitting of Normal distribution.
  - 9) Model sampling from Normal distribution using:
    - i) Normal table and ii) Box- Muller transformation.
  - 10) Model sampling from Uniform distribution.
  - 11) Model sampling from Exponential distribution.
  - 12) Computation on Large sample test, Chi-square test
  - 13) Computation on t-test, F-test.

**Learning Outcomes:**

- i) To compute relation between two and three variables.
- ii) To fit simple and multiple regression equations.
- iii) To draw and interpreted the graph of bivariate data.
- iv) To compute and interpret data by statistical techniques.
- v) To demonstrate bivariate and multivariate data.
- vi) To know the relations among the different distributions with real life situations.
- vii) To compute probabilities by using continuous probability distributions.
- viii) To measure and analyses the data by various statistical techniques.
- ix) To draw and interpreted the shape of continuous probability distributions.
- x) To explain various continuous distributions, statistical distributions and model sample

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE- 207: Electronics Paper-III: Electronic Circuits for Computer**

**Learning objectives:-**

- i. It presents the principle of circuit analysis and design.
- ii. To learn the basic concepts and characteristics of electronic devices and circuits.
- iii. To analyze transistor amplifier their frequency response
- iv. To verify the theoretical concept through laboratory and simulation experiment

**Unit I- Rectifier Circuits**

**(9)**

Filters, Regulator (Zener and Positive Voltage Regulator, Negative Voltage Regulator), IC 7805, IC 7905, LM 317.

**Unit II- Transistor Amplifiers**

**(9)**

CE, CB, CC Amplifier, Transistor as Buffer, Transistor as Switch, MOSFET Amplifier.

**Unit III- FET as VVR**

**(9)**

UJT as Sweep Generator, Transistor Oscillator, Crystal Oscillator

**Unit IV- Multivibrators**

**(9)**

Transistor as Astable, Bistable and Monostable Multivibrator

**Reference Books:**

1. Electronic Device and Circuit by Rama Reddy, Narosa publication Delhi (Unit 3 & a. Unit 4)
2. A text book of Applied Electronic by R. S. Sedha, S Chand publication (Unit 1 & Unit 2)
3. Principle of electronics: V.K. Mehta, S. Chand and Company Ltd. 5<sup>th</sup> Edition (Unit 1,2,3)
4. Power Electronics, techmax publications by J.S.Katre (Unit 2 & Unit 4)

**Learning outcomes:-**

**Unit 1:**

- i. Understand the concept of rectifier circuits.
- ii. Demonstrate the positive and negative voltage regulator.
- iii. Define the concept of Filters.

**Unit 2:**

- i. Explain the concept of Amplifier.
- ii. Understand the concept of CE, CB, CC amplifier.
- iii. Define Transistor as a Switch and Transistor as a buffer.
- iv. Define the concept of MOSFET amplifier.

**Unit 3:**

- i) Define the concept of VVR.
- ii) Explain UJT as sweep generator.
- iii) Understand the types of Oscillator.
- iv) Demonstrate Crystal Oscillator.

**Unit 4:**

- i) Explain basic concept of Multivibrator.
- ii) Demonstrate Transistor as Astable Multivibrator.
- iii) Define the concept of Monostable Multivibrator.
- iv) Verify the duty Cycle for Astable Multivibrator

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**B.Sc. Computer Science (Entire) Part-I: Semester- II**

**BCSE- 208: Electronics Paper-IV: Digital Fundamentals for Computer****Learning objectives:-**

- i. To understand number representation and conversion between different representation in digital electronics circuit
- ii. To analyze logical processes and implement logical operation using combinational logic circuit
- iii. To understand concept of sequential circuit and to analyze sequential system in terms of state machines
- iv. To implement the combinational and sequential circuit

**Unit I: Number System AND Binary Codes****(9)**

Binary, Octal, Hexadecimal Number system' Interconversion from one system to Another, BCD code, Gray code, Excess-3 code, ASCII code, Concept of parity. Signed and unsigned numbers, 1's complement and 2's complement of binary numbers and binary arithmetic.

**Unit II: Logic Gates****(9)**

Logic gates-AND, OR, NOT, NOR, NAND EX-OR (Symbol, Expression and Truth Table) Boolean algebra and identities; De Morgan's theorem and Interconversion of logic Gates; Simplifications of logic expressions using a) Boolean algebra), K-map.  
Introduction to logic families: TTL NAND gate, input output parameters, tristate logic, Fan in; fan out, propagation delay, noise margin.

**Unit III: Combinational Circuits****(9)**

Half adder, Full adder, half subtractor, Parallel adder, nibbles Adder; Arithmetic logic unit, Encoder, Decoder, Multiplexer, and Demultiplexer, concept of analog multiplexer.  
Pin Configuration of 74153, 74156, 7447, 74138.

**Unit IV: Sequential circuits****(9)**

Concept of sequential circuits; Latch, Flip-flops: RS, Clocked RS, JK, Master Slave JK, Counter-synchronous, asynchronous, up-down counter, modulo-N counter

**Reference Books:**

1. Digital Principles and applications- Malvino Leach, Tata McGraw Hill, 4<sup>th</sup> Edition ( Unit 1)

2. Digital Electronics C.F.strahglo ( Unit 1 & Unit 2)
3. Digital logic and Computer Design:Morris Mono.( Unit 3 & Unit 4)
4. Fundamental computers-V.Rajaraman ( Unit 1 & Unit 2)

**Learning Objectives:**

**Unit 1:**

- i) Understand the concept of Binary Number system used in computer.
- ii) Understand the inter conversion from one number system to another number system.
- iii) system.
- iv) Define the concept of ASCII code, gray code,etc.

**Unit 2:**

- i) Understand the basic concept of Logic Gates.
- ii) Verify the De Morgons theorem.
- iii) Explain the concept of K-Map.
- iv) Define the logic families and its characteristics.

**Unit 3:**

- i) Analyze Logic processes and implement logical operations using Combinational logic circuits.
- ii) Explain the concept of Adder.
- iii) Demonstrate the Half adder.
- iv) Define the concept of Analog Multiplexer.

**Unit 4:**

- i) Define and implement Sequential Logic Circuits.
- ii) Explain the concept of Flip/Flop .
- iii) Understand the Concept of Counter.

**BCSE-213: LAB8- ELECTRONICS  
(Based on BCSE-207 and BCSE-208)**

**Learning Objectives:**

- i) To understand the use of Voltage Regulator
- ii) To understand the concept of multivibrator
- iii) To use different adder and multiplexer
- iv) To Understand Counter and De-multiplexer

1. Positive Voltage Regulator using Three pin IC 7805
2. Negative Voltage Regulator using Three pin IC 7905
3. FET as VVR
4. Study of Astable/ bistable/ monostable multivibrator, Crystal Oscillator
5. Study of Logic Gate
6. Verification of De-Morgans Theorem
7. Universal gate using NAND gate
8. Universal gate using NOR gate
9. Study of Full / Half Adder
10. Study of Half Adder, Multiplexer, Flip-Flop, Counter, De-multiplexer

**Learning outcomes:-**

- i. To study the basic logic gates, combinational and sequential circuits
- ii. To study the operations of multi-meter(Analog & digital) ,function generator, regulator power supply and CRO
- iii. To verify De-Morgans Theorem
- iv. To understand and demonstration of analog and digital experiment

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**B.Sc. Computer Science (Entire) Part-I: Semester- II  
BCSE -209- : English for communication –II**

**Learning Objectives:**

1. To acquaint students with communication skills.
2. To inculcate human values among the students through poems and prose.
3. To improve the language and business competence of the students.

**Module V:** A. Telephonic Communication  
B. Lost Forest - Johannes Jensen  
C. Stopping by Woods - Robert Frost

**Module VI:** A. English for Specific Purposes  
B. Putting Data to Effective Use – Satish Tripathi

**Module VII:** A. Presentation Skills  
B. An Epithet- W. H. Davies

**Module VIII:** A. The Golden Touch -Nathaniel Hawthorne  
B. Night of the Scorpion

**Course Outcomes:**

1. The prescribed course equips students with nuances of language that includes proficiency in grammar, its effective usage in speaking and writing. It also develops their personality. → It further helps them to prepare for various competitive exams and to keep up with the increasing demand of English in Indian society.
2. Vocabulary improves their communication and writing skills, and at the same time equipping them to use modern forms of communication. Elective English (BA) → The study of elective subject of English.

**Reference Books:**

1. Shivaji University, Kolhapur, B.Sc. Part I (AECC) Compulsory English(CBCS)



## B.Sc. Computer Science (Entire)-I Semester –I and II

### Evaluation Pattern from June 2019

- Semester End Examination(SEE) -30
- Continuous Comprehensive Evaluation (CCE) -10

#### Semester End Examination SEE (50Marks)

##### Nature of Question Paper

Total Mark – 60

Duration – 2 Hours

Q.1 Multiple Choice Questions	10 marks.
Q.2 Broad Question (Attempt any Two out of Three)	20 marks.
Q.3 Short Question (Attempt any Four out of Six)	20 marks.

#### Continuous Comprehensive Evaluation CCE (20 Marks)

- 1) Offline test - 10 Marks
- 2) Online test - 10 Marks

#### Criteria of Passing-(separate heads of passing)

- 1) 4 Marks out of 10 Marks for Internal Evaluation.
- 2) 20 Marks out of 50 Marks for Theory Examination.

#### Pattern of Question Paper

##### SEMESTER-I and II

Q. No.	Sub question	Type of Question	Based on Unit	Marks
Q.1	A	Four multiple choice questions with four alternatives to be set.	Prose and poetry units.	04
	B	Answer in one word/phrase/sentence each. (Skimming and scanning questions to be set.	Prose and poetry units.	04
Q.2	A	Answer the following questions in three to four sentences each (4 out of 6)	Prose and poetry units.	08
	B	Write short notes on the following in about seven to eight sentences each (3 out of 5)	Prose and poetry units.	09
Q.3	A	Questions to be set on A)Telephonic Communication	Module V A	08
	B	B)English for advertising	Module VII A	07
Q.4	A	Question to be set on English for specific purposes	Module VI A	05
	B	Question to be set on Prose and poetry	Module VI A	05