

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonapat) SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Applications (BCA) 1st Year 2nd Semester Credit Based Scheme w.e.f. 2020-21

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA102C	Digital Design	3	0	-	25	75	-	100	3	3
2.	BCA104C	Data Structure using C	3	0	-	25	75	-	100	3	3
3.	BCA106C	Data Base Management System	3	0	-	25	75	-	100	3	3
4.	MATHS112C	Mathematics-II	3	0	-	25	75	-	100	3	3
5.	HUM202BC	Communication Skill -II	3	0	-	25	75	-	100	3	3
6.	BCA124C	Software Lab-III (Based on BCA104C)	-	-	4	25	-	75	100	2	3
7.	BCA126C	Software Lab-IV (Based on BCA106C)	-	-	4	25	-	75	100	2	3
8.	HUM222BC	Soft Skill Seminar-II (Based on HUM202BC)	-	-	2	25	-	75	100	1	3
TOTAL			15	0	10	200	375	225	800	20	

L = Lecture, T = Tutorial, P = Practical, AUD = Audit Course, & C = Credits NOTE:

1. For student admitted in B. Tech. 1st Semester (C-Scheme) in 2019 and all trailing students, Examinations and evaluation of students shall be conducted as per guidelines AICTE Examinations Reforms covering the entire syllabus. The students shall be made aware about the reforms.
2. Students will be allowed to use Non-programmable scientific calculator. However, sharing of calculators will Not be permitted in the examinations

Semester – 2nd

Subject: Digital Design

Subject Code: BCA102C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

UNIT I

Topic No:1 Information Representation: Number Systems,
 Topic No:2: Arithmetic, Fixed-point and Floating point representation of numbers,
 Topic No:3: BCD Codes, Error detecting and correcting codes,
 Topic No:4: Character Representation – ASCII, EBCDIC, Unicode.

UNIT II

Topic No:5: Binary Logic: Boolean Algebra, Boolean Theorems,
 Topic No:6: Boolean Functions and Truth Tables,
 Topic No:7: Canonical and Standard forms of Boolean functions,
 Topic No:8: Simplification of Boolean Functions – Venn diagram, Karnaugh Maps.

UNIT III

Topic No:9: Digital Logic: Basic Gates – AND, OR, NOT,
 Topic No:10: Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc.
 Topic No:11: Combinational Logic – Characteristics, Design Procedures, analysis procedures.

UNIT IV

Topic No:12: Combinational Circuits: Half-Adder, Full-Adder,
 Topic No:13: Half- Subtractor, Full- Subtractor, Encoders, Decoders,
 Topic No:14: Multiplexers, De multiplexers.

Sequential Circuits:

Topic No:15: Flip-flops S-R, D, J-K, T, Clocked Flip-flop,
 Topic No:16: Race around condition, Master slave Flip-Flop,
 Topic No:17: Realization of one flip-flop using other flip-flop.

TEXT/REFERENCE BOOKS

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill
5. Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation,

University Science Press (Laxmi Publications), New Delhi

Note: Examiner will be required to set NINE questions in all. Question Number 9 will be compulsory (short-answer type questions), covering the entire syllabus and carrying 15 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus carrying 15 marks. Student will be required to attempt FIVE questions in all. Question Number 9 will be compulsory. In addition, student will have to attempt four more questions selecting one question from each Unit.

COURSE OUTCOMES

Upon successful completion of this course, the student will be able to:

1. Can convert different types of number representation used in computer.
2. Familiarization and drawing of logic circuits using AND, OR, NOT, NAND & NOR gates.
3. Understand Boolean algebra and its properties; able to simplify Boolean function.
4. Analyze and design combinational circuit and can differentiate combinational & sequential circuits.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

COURSE CONTENT

UNIT I

Introduction:

Topic No:1: data organization, Data Structure definition, Data type vs. data structure,
 Topic No:2: Categories of data structures, Data structure operations
 Topic No:3: Applications of data structures,
 Topic No:4: complexity and time-space tradeoff.

UNIT II

Arrays:

Topic No:5: Introduction, Linear arrays, Representation of linear array in memory,
 Topic No:6: Address calculations, Traversal, Insertions, Deletion in an array
 Topic No:7: Searching (linear, Binary), Sorting (Bubble, Selection, Insertion), merging of arrays. Linked List:
 Topic No:8: Introduction, Array vs. linked list, Representation of linked lists in memory,
 Topic No:9: Traversal, Insertion, Deletion, Searching in a linear linked list,
 Topic No:10: of Header linked list, Circular linked list, Two-way linked list
 Topic No:11: Threaded lists, Garbage collection, Applications of linked lists.

UNIT III

Stack

Topic No:12: Introduction, Array and linked representation of stacks,
 Topic No:13: Operations on stacks, Applications of stacks: Polish Notation, Recursion.

Queues:

Topic No:14: Introduction, Array and linked representation of queues,
 Topic No:15: on queues, Applications of queues.

UNIT IV

Tree:

Topic No:16: Introduction, Definition, Representing Binary tree in memory,
 Topic No:17: Traversing binary trees, Traversal algorithms using stacks.
 Topic No:18: of Binary Search Tree.

Graph:

Topic No:19: Graph theory terminology, Sequential and linked representation of graphs
 Topic No:20: BFS and DFS algorithms

TEXT/REFERENCE BOOKS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill.
2. An introduction to data structures and application by Jean Paul Tremblay & Pal G. Sorenson
3. R.L. Kruse, B.P. Leary, C.L. Tondo, Data structure and program design in C, PHI
4. R. B. Patel, Expert Data Structures With C, Khanna Publications, Delhi, India, 3rd Edition 2008.
5. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
6. Data Structures and Algorithms by A. V. Aho, J. E. Hopcroft and T. D. Ullman, Original edition, Addison- Wesley, 1999, Low Price Edition.
7. Fundamentals of Data Structure by Ellis Horowitz & Sartaj Sahni, Pub, 1983. AW

8. Data Structure and Program design in C by Robert Kruse, PHI

Note: Examiner will be required to set NINE questions in all. Question Number 9 will be compulsory (short-answer type questions), covering the entire syllabus and carrying 15 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus carrying 15 marks. Student will be required to attempt FIVE questions in all. Question Number 9 will be compulsory. In addition, student will have to attempt four more questions selecting one question from each Unit.

COURSE OUTCOMES

After completion of this course student will able to

1. Decide the appropriate data type and data structures for a given problem.
2. Write the algorithms for various operations on Arrays, Queues ,Stacks and linked list.
3. Implementation of tree traversal.
4. Understanding Sequential and linked representation of various data structure.



Semester – 2nd

Subject: Data Base Management System

Subject Code:BCA106C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

UNIT I

Basic Concepts

Topic No:1:Data, Information, Records and files. File Based Approach,
 Topic No:2:Limitations of File Based Approach, Database Approach,
 Topic No:3: Characteristics of Database Approach, advantages and disadvantages of database system
 Topic No:4:Database Management System (DBMS), Components of DBMS ,
 Topic No:5:DBMS Functions, Advantages and Disadvantages of DBMS
 Topic No:6:Database Languages – DDL, DML, DCL.
 Topic No:7: Roles in the Database Environment : Data and Database Administrator,
 Topic No:8: Database Designers, Applications Developers and Users.

UNIT II

Database System Architecture:

Topic No:9:Three Levels of Architecture, External, Conceptual and Internal Levels
 Topic No:10:Schemas, Mappings and Instances.
 Topic No:11: Data Independence – Logical and Physical Data Independence
 Topic No:12:Classification of Database Management System,
 Topic No:13:Centralized and Client Server architecture to DBMS.

UNIT III

Database Models and Implementation:

Topic No:14:Data Model and Types of Data Model, Relational Data Model,
 Topic No:15: Hierarchical Model, Network Data Model,
 Topic No:16: Object/Relational Model, Object-Oriented Model;

Entity-Relationship Model:

Topic No:17: Entity Types, Entity Sets, Attributes Relationship Types,
 Topic No:18:Relationship Instances and ER Diagrams, abstraction and integration.

Relational Data Model:

Topic No:19: Database Relations, Properties of Relations, Keys,
 Topic No:20:Domains, Integrity Constraints over Relations

UNIT IV

Topic No:21:SQL: Data types, Basic Queries in SQL, Insert,
 Topic No:22:Delete and Update Statements, Views,
 Topic No:23:Transaction management: ACID Properties, Transaction states,
 Topic No:24:Concurrency control: Concurrency Control –Overview, Concurrency control problems,
 Topic No:25: Locks, Locking Protocols, Deadlocks.

TEXT/REFERENCE BOOKS

1. Korth, Silberschatz, Database System Concepts, 4th Ed., TMH.
2. Elmasri&Navathe: Fundamentals of Database Systems, 4th Ed., A. Wesley
3. Thomas ConNolly Carolyn Begg, “Database Systems”, 3/e, Pearson Education
4. C. J. Date, “An Introduction to Database Systems”, 8th edition, Addison Wesley N. Delhi.

Note: Examiner will be required to set NINE questions in all. Question Number 9 will be compulsory (short-answer type questions), covering the entire syllabus and carrying 15 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus carrying 15 marks. Student will be required to attempt FIVE questions in all. Question Number 9 will be compulsory. In addition, student will have to attempt four more questions selecting one question from each Unit.

COURSE OUTCOMES

By the end of the course the students will be able to:

1. Describe the fundamental elements of DBMS.
2. Explain the basic concepts of relational data model, ER model.
3. Understand the concepts of database security, integrity and concurrency.
4. Can construct simple and moderate database queries using SQL.



MATHS112C – MATHEMATICS-II

BCA Semester - II

L	T	P	Credits
3	0	-	3

Class Work	: 25 Marks
Examination	: 75 Marks
Total	: 100 Marks
Duration of Examination	: 03 Hours

COURSE OBJECTIVE

Upon completion of this course the student should be able to:

1. understand basic concepts of limits and continuity and can solve quadratic equations.
2. describe how correlation is used to identify relationship between two variables.
3. understand how regression analysis is used to predict outcomes.
4. understand the basic concepts of dependent and independent events, probability and conditional probability.
5. apply distance formula to find the distance between two points.

COURSE OUTCOMES

By the end of the course the students will be able to:

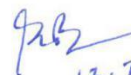
1. apply concepts of probability and basic rules including Baye's theorem.
2. calculate and understand that correlation coefficient is a number that measure strength of association b/w two variables.
3. understand basics of limits and continuity and can solve quadratic equations.
4. understand the line of best fit as tool for summarizing a linear relationship & predicting future observed values.
5. plot the points in coordinate plane and easily apply distance formula to find the distance between two points

COURSE CONTENT

UNIT I

Limits & Continuity: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity of a function at a Point, Continuity over an Interval, Sum, product and quotient of continuous functions, Type of Discontinuities.

Quadratic Equations: Solution of Quadratic Equations by factor method, completing square method, and Discriminant method, Relation between roots and coefficients


13.3.2020
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D.C.R. University of Sc. & Tech.
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UNIT II

Probability: Sample space and events, Probability, The axioms of probability, Addition theorem on probability & problems, Multiplication theorem, Conditional probability, Baye's theorem and related problems.

UNIT III

Correlation Analysis: Definition, Types of Correlation: Positive, Negative, Linear and Non-Linear. Need of Correlation Analysis, Techniques for Measuring Correlation: Scatter Diagram Method, Graphic Method, Karl Pearson's Coefficient of Correlation, Rank Correlation.

Linear Regression: Definition, Difference between Correlation and Regression, Types of Regression Analysis: Objectives of Regression Analysis, Methods of obtaining regression analysis: Regression Lines. Methods of obtaining regression lines: Normal Equations and Regression Coefficient, Properties of Regression Coefficient.

UNIT IV

Co-ordinate Geometry: Distance formulae, section formulae, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line.

TEXT/REFERENCE BOOKS

1. 11th & 12th NCERT Mathematics books.
2. Grewal, B.S. :Elementary Engineering Mathematics
3. Gupta S.C. and Kapoor V.K. : Fundamentals of mathematical Statistics, Sultan Chand & Sons.
4. Gupta, S.P., 2003 : Statistical Methods, S. Chand.

Note: Examiner will be required to set NINE questions in all. Question Number 9 will be compulsory (short-answer type questions), covering the entire syllabus and carrying 15 marks. In addition to the compulsory question there will be four units, i.e., Unit-I to Unit-IV. Examiner will set two questions in each Unit. Students will be required to attempt FIVE questions in all, selecting one question from each of Unit I-IV and the compulsory question.


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Deptt. of Mathematics
D.C.R. University of Sc. & Tech.
Murthal, Sonapat (Hr.)

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

UNIT I
Vocabulary

Topic No:1:Language Skills: Words often confused, One Word Substitute,
 Topic No:2:Antonyms, Synonyms, Vocabulary of academic world, technology,
 Topic No:3:Life stages, sports, emotions, greetings, apologies

UNIT II
Soft Skills

Topic No:4:Communication: Body language, kinesic communication,
 Topic No:5:proxemic communication, haptic communication,
 Topic No:6: paralinguistic communication, chroNomatic communication Business etiquettes,
 Topic No:7:introduction etiquettes, email etiquettes, telephone etiquettes,
 Topic No:8: telemarketing etiquettes, elevator etiquettes,
 Topic No:9:dressing and grooming etiquettes, dining etiquettes

UNIT III
Oral Presentation

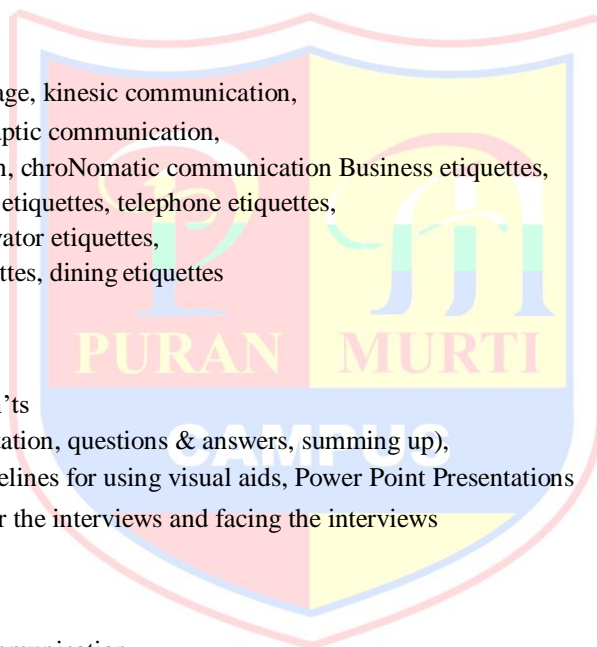
Topic No:10:Presentations: Do's and Don'ts
 Topic No:11:Distribution of time (presentation, questions & answers, summing up),
 Topic No:12:& Visual presentation, Guidelines for using visual aids, Power Point Presentations
 Topic No:13:Job interviews: Preparing for the interviews and facing the interviews

UNIT IV
Business Communication

Topic No:14:Significance of business communication
 Topic No:15:Letters: Business letters, Office memorandum, Social letters,
 Topic No:16:Sales letters, Letter styles/ layout
 Topic No:17:Report Writing: Meaning & Definition, Types of report (Business report & Academic report),
 Topic No:18:Format of report, Drafting the report, Layout of the report,
 Topic No:19: Essential requirement of good report writing

TEXT/REFERENCE BOOKS

1. Bhatnagar, Nitin, and Mamta Bhatnagar. Communicative English for Engineers and Professionals. Pearson Education, 2013.
2. Gowers, Ernest. The Complete Words. Penguin, 1973
3. Konar, Nira. English Language Laboratories: A Comprehensive Manual. PHI, 2011.
4. Ludlow, R., and F. Pantan. The Essence of Effective Communication. PHI, 1995.
5. Rizvi, M. Ashraf. Effective Technical Communication. McGraw Hill, 2014.
6. Sharma, Sangeeta, and BiNod Mishra. Communication Skills for Engineers and Scientists. PHI, 2009.



SCHEME OF END SEMESTER THEORY EXAMINATION

1. The duration of the exam will be 3 hours.
2. The Question Paper shall have nine questions.
3. Each question will be of 15 marks.
4. The student is required to attempt five questions, Questions No. 1 to 8 will be set in such manners that two questions are set from each unit of the syllabus. A student will have to attempt four questions selecting one question from each unit. The questions on Unit III may be in the form of comprehension passage, long/short answer question, explanation of lines/passage from the text with reference to the context or on the vocabulary and grammar items.
5. Question number 9 will be compulsory covering the entire syllabus and it will be in the form of short-answer type questions.



Semester – 2nd**Subject: Software Lab-III(Based on BCA104C)****Subject Code: BCA124C**

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Topics to be covered:-

1. Operations on Data Structure – Traversing, Searching, Sorting and insertion-deletion in Array.
2. Application of Data Structure – Sparse matrix, postfix evaluation of expression
3. Operation on Stack and Queue using array and linked list.
4. Implementation of linear linked list(Traversing, insertion, deletion and searching).
5. Implementation of Tree traversal (preorder, iNorder, postorder).



Semester – 2nd

Subject: Software Lab-IV(Based on BCA106C)

Subject Code: BCA126C

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

Topics to be covered:-

Students are required to attempt at least 10 exercises based on the syllabi of subject “BCA106C” e.g. Create a database and write the programs to carry out the following operation:

- Add a record in the database
- Delete a record in the database
- Modify the record in the database
- List all the records of database in ascending order.
- Operations views



Semester – 2nd

Subject: Soft Skill Seminar-II (Based on HUM202BC)

Subject Code: HUM222BC

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	-	-	3	25	75	3 hours	100

COURSE OBJECTIVE

- To hone up students' English Language competence for speaking skills

COURSE CONTENT

- Practicing tele-conferencing, video conferencing and web conferencing through mock situations; Conducting and participating in mock interviews; Group Discussions, Practice in public speaking, presentations

NOTE: Conversation in English will be mandatory for all the students.

Students will be made to practice English language through simulations and practice sessions with the help of language lab software, CDs and BBC's online language learning modules. This drilling method would certainly give them a feel of real life situations and make them communicate accurately and fluently.

RECOMMENDED READING

- Konar, Nira. English Language Laboratories: A Comprehensive Manual. PHI, 2011.
- Sadannad, Kamlesh, and Susheela Punitha. Spoken English: A Foundation Course. Orient Longman, 2008.

2. SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 75 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the university's Controller of Exams.

NOTE: Students will be tested for their oral communication competence by making them participate in formal presentations, group discussion, formal exchanges, and mock web, tele and video conferencing. Students will also be evaluated through a viva voce conducted by the external examiner.