# PRESTIGE INSTITUTE OF MANAGEMENT & RESEARCH, GWALIOR

AN AUTONOMOUS INSTITUTE ACCREDITED WITH UGC NAAC GRADE 'A' AND NBA (AICTE)

## External PO Attainment BCA

| | | | | | | Difficulty Threshold (Passing Mark) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Step 1 | | Fill "Relevance" of each subject towards a PO out of 3 | #Students above threshold | Level | Hard | Medium | Easy |
| | | | Step 2 | | Fill # Students scoring Average Marks | 80% | 3 | 40% | 50% | 60% |
| | | | Step 2 | | Score Level will automatically be calculated | 70% | 2 | 40% | 50% | 60% |
| | | | Step 3 | | PO attainment scores will be automatically calculated | 60% | 1 | 40% | 50% | 60% |
| | | | Step 4 | | **PO Attainment out of 3 Automatically Calculated** | | 0 | 40% | 50% | 60% |
| | | | Step 5 | | PO Attainment % Automatically Calculated | | | | | |
| Difficulty | Threshold | # Students above Threshold | Score Level | Code | Cos/Subjects | Relevance (Co-relation factors on the scale of 0-3) | | | | |

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| | | | | | | PO1: Acquire Knowledge of mathematical foundations, computer application theory and algorithm principles in the design and modelling of computer based system. | PO2: Understand to design, analyze and develop solutions and evaluate system components/processes to meet specific need for various domains. | PO3: Create, select, adapt and apply appropriate technologies and tools to a wide range of computational activities while understanding their limitations | PO4: Communicate effectively by being able to comprehend effective documentation and presentations. | PO5: Ability to engage in independent learning for continuous self-development as a computer application professional. |
| E | 60% | 95.0% | 3 | BCA 101 CO1 | Enhance the learner's communication skills by giving adequate exposure in listening, speaking, reading and writing skills and the related sub-skills. Recognize and operate in various styles and registers in English. | | | | 3 | 2 |
| E | 60% | 92.0% | 3 | BCA 101 CO2 | Identify and repair the voids in his present vocabulary and pronunciation targeting those specific arrays of words, which create a barrier in his thought process. | | | | 3 | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 95.0% | 3 | BCA 101 CO3 | Boost confidence in oral and interpersonal communication by reinforcing the basics of pronunciation specially focusing on interviews/ corporate meetings/ international business travels. | | | | 3 | 2 |
| E | 60% | 95.0% | 3 | BCA 101 CO4 | Achieve adequate linguistic skills to students compete well in international certification tests of English such as IELTS and TOEFL | | | | 3 | 2 |
| H | 40% | 89.0% | 3 | BCA-102 CO1 | Understand the concepts of logic gates, Different Digital Circuit. Explain different number systems and apply to create representation of numbers in computers | 2 | 2 | 2 | | 3 |
| E | 60% | 57.0% | 0 | BCA-102 CO2 | Describe the organization of computer and its design | 2 | 2 | 2 | | 3 |
| E | 60% | 28.0% | 0 | BCA-102 CO3 | Understand the basics of computer architecture | 2 | 2 | 2 | | 3 |
| E | 60% | 61.0% | 1 | BCA-102 CO4 | Examine the organization of various types of memories and I/O organization. | 2 | 2 | 2 | | 3 |
| E | 60% | 75.0% | 2 | BCA-103 CO1 | Understand the problem solving constructs and techniques through flowcharts. Understand concepts of tokens and predefined functions of C language | 2 | 2 | 2 | | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 30.0% | 0 | BCA-103 CO2 | Understand and apply control statements and arrays to solve problems for Computers | 2 | 2 | 2 | | 3 |
| E | 60% | 95.0% | 3 | BCA-103 CO3 | Create modular program using functions and utilize various storage class | 2 | 2 | 2 | | 3 |
| E | 60% | 64.0% | 1 | BCA-103 CO4 | Understand and apply pre-processor directives, structures, and union in solving problems | 2 | 2 | 2 | | 3 |
| E | 60% | 75.0% | 2 | BCA-104 CO1 | Understand the key concept of successive differentiation and apply them to solve various Problems. Describe concept of Partial derivatives and its applications. | 3 | 2 | 3 | 1 | 2 |
| M | 50% | 67.0% | 1 | BCA-104 CO2 | Analyse the concept of Envelope Evolutes, maxima, and minima for the function of two variables. | 3 | 3 | 2 | 1 | 2 |
| E | 60% | 77.0% | 2 | BCA-104 CO3 | Understand to apply Beta and Gamma function to simplify integration. | 2 | 2 | 2 | 1 | 2 |
| M | 50% | 74.0% | 2 | BCA-104 CO4 | Apply integration to calculate the area and volume of different types of curve. | 3 | 2 | 2 | 1 | 2 |
| E | 60% | 82.0% | 3 | BCA-105 CO1 | To Apply Basics of C-Language like, Variables, Control Statements, Arrays, Structures and pointers in developing programs. | 1 | 3 | 2 | | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 95.0% | 3 | BCA-106 CO1 | Proficiently use Microsoft Word to create, format, and edit various types of documents. and Effectively manipulate data in Microsoft Excel for tasks ranging from basic calculations to complex data analysis. | 3 | 1 | 2 | | 3 |
| E | 60% | 98.0% | 3 | BCA-201 CO1 | To use basic English Grammar in verbal and non-verbal communication. To understand and implement effective listening, reading, writing and Speaking Skills in day-to-day activities | | | | 3 | 2 |
| E | 60% | 98.0% | 3 | BCA-201 CO2 | Demonstrate the effective presentation skills | | | | 3 | 2 |
| H | 40% | 98.0% | 3 | BCA-201 CO3 | To use process of formal communication | | | | 3 | 2 |
| H | 40% | 95.0% | 3 | BCA-201 CO4 | To illustrate various formats used in business writing & the use of external aids involved in effective presentation | | | | 3 | 2 |
| M | 50% | 89.0% | 3 | BCA-202 CO1 | Understand and identify potential benefits of Object-oriented programming over other approaches. Understand and apply object- oriented programming concept like class & object to develop solutions of the problems. | 3 | 3 | 2 | 1 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 88.0% | 3 | BCA-202 CO2 | Apply the concept of polymorphism by overloading the operator and functions in solving the real-world problem | 2 | 2 | 3 | 1 | 3 |
| E | 60% | 89.0% | 3 | BCA-202 CO3 | Create the classes through the concept of inheritance to achieve modularity by reusing the exiting code | 2 | 2 | 3 | 1 | 3 |
| M | 50% | 86.0% | 3 | BCA-202 CO4 | Implement data persistence through file handing. | | | 1 | 2 | 3 |
| H | 40% | 25.0% | 0 | BCA-203 CO1 | Understand the basic concepts of data structure and particulate linear data structures and permitted operations. Understand and apply linked list data structure for solving problems | 2 | 1 | 1 | | 2 |
| H | 40% | 54.0% | 0 | BCA-203 CO2 | Articulate the tree data structures and permitted operations | 3 | 1 | 1 | | 2 |
| H | 40% | 45.0% | 0 | BCA-203 CO3 | Articulate the graph data structures and permitted operations | 3 | 1 | 1 | | 2 |
| H | 40% | 59.0% | 0 | BCA-203 CO4 | Implement Searching and Sorting algorithms & Understand the concepts of file organization Techniques | 2 | 1 | 1 | | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| M | 50% | 88.0% | 3 | BCA-204 CO1 | Understand the concept of differential equations of first order and first degree and its various methods. Analyse concept of linear differential equations of higher order with constant coefficients. | 3 | 3 | 3 | 1 | 2 |
| E | 60% | 95.0% | 3 | BCA-204 CO2 | Analyse the formulation and classification of Partial Differential Equations. | 3 | 3 | 3 | 1 | 2 |
| H | 40% | 98.0% | 3 | BCA-204 CO3 | Apply the methods to solve linear PDE of higher order and its application. | 3 | 3 | 2 | 1 | 2 |
| M | 50% | 93.0% | 3 | BCA-204 CO4 | Understand the concept of Bessel and Legendre functions and derive recurrence relations. | 3 | 2 | 2 | 1 | 2 |
| M | 50% | 100.0% | 3 | BCA-205 CO1 | Design and implement Object Oriented program in C++ by using various features like class, object, inheritance and polymorphism etc. | 2 | 3 | 2 | 2 | 3 |
| M | 50% | 98.0% | 3 | BCA-206 CO1 | Apply various data structures to design efficient solutions of real-world problems. | 1 | 3 | 2 | | 3 |
| M | 50% | 63.0% | 1 | BCA-301 CO1 | Understand the Database concepts, DBMS software and supported architecture. Design and implement databases using concepts of data models | 2 | 1 | 1 | 1 | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 64.0% | 1 | BCA-301 CO2 | Analyze databases using normal forms for reducing redundancy. | 2 | 1 | 1 | 1 | 2 |
| H | 40% | 71.0% | 2 | BCA-301 CO3 | Create SQL and relational algebra expressions to retrieve and manage database. | 2 | 1 | 1 | 1 | 2 |
| M | 50% | 79.0% | 2 | BCA-301 CO4 | Implement transaction processing and concurrency control concepts. | 2 | 1 | 1 | 1 | 2 |
| H | 40% | 61.0% | 1 | BCA-302 CO1 | Understand the basics of different display device and input device. Implement line drawing and fill algorithms | 3 | 2 | 2 | 1 | 1 |
| H | 40% | 68.0% | 1 | BCA-302 CO2 | Implement different clipping algorithm | 3 | 2 | 2 | 1 | 1 |
| H | 40% | 52.0% | 0 | BCA-302 CO3 | Understand and use various geometric transformation | 2 | 2 | 1 | 1 | 1 |
| H | 40% | 84.0% | 3 | BCA-302 CO4 | Explain the concept of multimedia | 1 | 1 | 1 | 2 | 2 |
| H | 40% | 52.0% | 0 | BCA-303 CO1 | To learn the fundamentals of OS, gain the knowledge on the basics of instruction execution, processor registers and how components of system communicate with each other. : To learn the concept of process and how OS manages processors and memory. | 2 | 3 | 2 | 3 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 61.0% | 1 | BCA-303 CO2 | To gain knowledge about the mechanisms of OS for synchronizing processes and understanding various problems of synchronization. | 2 | 3 | 3 | 3 | 2 |
| H | 40% | 71.0% | 2 | BCA-303 CO3 | To learn the concept of deadlocks and various algorithms for handling deadlocks. | 2 | 2 | 2 | 3 | 3 |
| H | 40% | 52.0% | 0 | BCA-303 CO4 | To understand various memory management techniques implemented by OS. | 2 | 2 | 3 | 3 | 3 |
| H | 40% | 27.0% | 0 | BCA-304 CO1 | Understand the key concept of proposition, set theory and its various types. Understand the concept of Relation and function and its various kinds | 3 | 1 | 2 | | 3 |
| H | 40% | 50.0% | 0 | BCA-304 CO2 | Apply Boolean expression representing circuits and analyse the different aspects of graphs. | 3 | 1 | 3 | | 3 |
| H | 40% | 61.0% | 1 | BCA-304 CO3 | Understand the concept of matrix to evaluate rank and nullity of matrix. | 3 | 2 | 3 | 2 | 3 |
| M | 50% | 70.0% | 2 | BCA-304 CO4 | Evaluate Eigen value and Eigen vector and to solve simultaneous equation by matrix. | 3 | 2 | 3 | 2 | 3 |
| E | 60% | 95.0% | 3 | BCA-305 CO1 | Design and implement Web application using VB.net | 1 | 3 | 2 | | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 95.0% | 3 | BCA-306 CO1 | Write SQL statements for creating and manipulating databases using RDBMS. | 1 | 2 | 2 | 1 | 3 |
| E | 60% | 91.0% | 3 | BCA-307 CO1 | Creating and manipulating various basic building blocks of Computer graphics. | 2 | 3 | 2 | 1 | 3 |
| E | 60% | 93.0% | 3 | BCA-308 CO1 | Design and implement window application using VB. Net | 1 | 3 | 2 | 2 | 2 |
| M | 50% | 71.0% | 0 | BCA-401 CO1 | Understand the use and key concept of HTML, CSS, JavaScript. Understand and apply features of JavaScript and Jquery for event handling | 3 | 3 | 2 | 1 | 3 |
| E | 60% | 80.0% | 0 | BCA-401 CO2 | Apply basic features of PHP for creating dynamic webpages | 2 | 2 | 3 | 1 | 3 |
| H | 40% | 92.0% | 1 | BCA-401 CO3 | Use control statement, array, regular expression of PHP in webpage creation. | 2 | 2 | 3 | 1 | 3 |
| M | 50% | 59.0% | 0 | BCA-401 CO4 | Create webpages for database handling through MySQL | | 2 | 1 | 2 | 3 |
| H | 40% | 57.0% | 0 | BCA-402 CO1 | Explain the basics of java language and Apply OOPs concept in solving the real problem | 3 | 3 | 2 | 1 | 3 |
| H | 40% | 65.0% | 1 | BCA-402 CO2 | Able to Use of package and collection frame work for solving the problem | 2 | 2 | 2 | 2 | 2 |
| H | 40% | 47.0% | 0 | BCA-402 CO3 | To develop the robust and high performance system | 1 | 2 | 3 | 2 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 39.0% | 0 | BCA-402 CO4 | Develop GUI and Event handling application | 1 | 2 | 3 | 3 | 3 |
| E | 60% | 100.0% | 3 | BCA-403 CO1 | Explain Software development Life cycle models. Create SRS and asses the efforts required to develop software | 2 | 2 | 2 | 3 | 3 |
| E | 60% | 100.0% | 3 | BCA-403 CO2 | Understand software design fundamentals | 3 | 3 | 2 | 3 | 3 |
| H | 40% | 98.0% | 3 | BCA-403 CO3 | Design software by applying different techniques | 3 | 3 | 3 | 3 | 3 |
| M | 50% | 98.0% | 3 | BCA-403 CO4 | Explain concepts of software measures, Software testing, reverse engineering, UML | 3 | 3 | 2 | 3 | 3 |
| H | 40% | 43.0% | 0 | BCA-404 CO1 | Understand the concept of approximate numbers, errors in numbers, zeroes or roots of polynomial and/or transcendental equations, difference operators and statistical terms. Apply Iterative techniques to solve polynomial and/or transcendental equations and simultaneous linear equations | 2 | 1 | 2 | 1 | 2 |
| H | 40% | 43.0% | 0 | BCA-404 CO2 | Apply mathematical relationships for given observations of the variable using Interpolation techniques. | 2 | 1 | 1 | | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 65.0% | 1 | BCA-404 CO3 | Analyse statistical data using measures of central tendency, dispersion, skewness and Kurtosis. | 2 | 2 | 2 | 1 | 2 |
| M | 50% | 45.0% | 0 | BCA-404 CO4 | Understand the concept of correlation and simple linear regression analysis for a set of data | 3 | 2 | 1 | 1 | 2 |
| E | 60% | 100.0% | 3 | BCA-405 CO1 | Develop solutions for basic problems using various features of Python | 2 | 3 | 3 | 2 | 3 |
| E | 60% | 100.0% | 3 | BCA-406 CO1 | Design and implement web application using HTML, CSS, JavaScript and PHP. | 1 | 3 | 2 | 2 | 3 |
| E | 60% | 88.0% | 3 | BCA-407 CO1 | Design and implement Object oriented programs using various features of Java Programming language. | 1 | 3 | 3 | 1 | 3 |
| E | 60% | 100.0% | 3 | BCA-408 CO1 | Design and implement web application for solving real world problems. | 2 | 3 | 2 | 2 | 3 |
| H | 40% | 59.0% | 0 | BCA-501 CO1 | To understand and build web application using MVC model. To perform database operation in web application through JDBC | 2 | 3 | 3 | 2 | 3 |
| H | 40% | 69.0% | 1 | BCA-501 CO2 | Apply servlet API to develop dynamic web application | 2 | 3 | 3 | 2 | 3 |
| H | 40% | 69.0% | 1 | BCA-501 CO3 | Apply JSP API to develop dynamic web application | 2 | 3 | 3 | 2 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 49.0% | 0 | BCA-501 CO4 | Use java beans in web application development | 2 | 3 | 3 | 2 | 3 |
| M | 50% | 80.0% | 3 | BCA-502 CO1 | Define and understand basic working of computer network and its components. Apply and Understand the Analog and Digital data transmission and transmission impairments | 2 | 3 | 1 | 2 | 2 |
| E | 60% | 84.0% | 3 | BCA-502 CO2 | Understand the basic concept of OSI and TCP reference model | 2 | 3 | 2 | 3 | 3 |
| H | 40% | 86.0% | 3 | BCA-502 CO3 | Understand, define and analyse the basics of ISDN, ATM data link services and standard data link layer protocols | 2 | 2 | 2 | 3 | 2 |
| M | 50% | 55.0% | 0 | BCA-502 CO4 | Understand, identify and adapt the basic concept of IEEE standards protocols and networking devices for communications. | 2 | 2 | 3 | 3 | 3 |
| H | 40% | 57.0% | 0 | BCA-503 CO1 | Demonstrate fundamental understanding of the AI history and its foundations.Understand elements constituting problems and learn to solve it by various uninformed and informed (heuristics based) searching techniques | 2 | 2 | 2 | | 2 |
| H | 40% | 35.0% | 0 | BCA-503 CO2 | Understand different methods of knowledge representation and reasoning. | 2 | 2 | 2 | | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 27.0% | 0 | BCA-503 CO3 | Be able to describe and apply the artificial neural network models and their learning algorithms in solving problems | 2 | 2 | 2 | | 2 |
| H | 40% | 65.0% | 1 | BCA-503 CO4 | CO4:Be able to describe different activation function, regularization techniques, Fuzzy Sets and Fuzzy Logic | 2 | 2 | 2 | | 2 |
| E | 60% | 100.0% | 3 | BCA-504 CO1 | Design and implement solutions of real world problems using suitable technology. | 2 | 3 | 2 | 2 | 3 |
| M | 50% | 98.0% | 3 | BCA-505 CO1 | Design and implement MVC based web application using servlet, JSP and java beans. | 1 | 3 | 2 | 1 | 3 |
| E | 60% | 100.0% | 3 | BCA-506 CO1 | Develop programs in Oracle using PL/SQL. | 1 | 2 | 2 | 1 | 3 |
| H | 40% | 60.0% | 1 | BCA-601 CO1 | Understand basics of C # programming language. Implement solutions for problems in C #. | 3 | 2 | 3 | 2 | 2 |
| E | 60% | 70.0% | 2 | BCA-601 CO2 | Design and implement web forms in Asp.net. | 3 | 3 | 3 | 2 | 3 |
| H | 40% | 94.0% | 3 | BCA-601 CO3 | Design and implement web forms with validation in Asp.net | 3 | 3 | 3 | 2 | 3 |
| M | 50% | 90.0% | 3 | BCA-601 CO4 | Create web forms for performing CURD operations on databases in Asp.net. | 3 | 2 | 3 | 2 | 3 |
| M | 50% | 62.0% | 1 | BCA-602 CO1 | To understand Linux features and commands and to understand mobile OS | 2 | 2 | 3 | 2 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| E | 60% | 46.0% | 0 | BCA-602 CO2 | to understand architecture of android OS | 2 | 2 | 3 | 2 | 3 |
| H | 40% | 94.0% | 3 | BCA-602 CO3 | to understand android framework and their components | 1 | 2 | 3 | 3 | 3 |
| M | 50% | 60.0% | 1 | BCA-602 CO4 | To develop mobile app in android device | 2 | 2 | 3 | 3 | 3 |
| M | 50% | 76.0% | 2 | BCA-603 CO1 | Understand the fundamental concepts of software testing. Design the test cases though different black box testing techniques | 2 | 2 | 3 | 2 | 3 |
| E | 60% | 76.0% | 2 | BCA-603 CO2 | Design the test cases though different white box testing techniques | 2 | 2 | 3 | 2 | 3 |
| H | 40% | 92.0% | 3 | BCA-603 CO3 | Understand and Appreciate the importance of different levels of testing | 2 | 2 | 3 | 3 | 3 |
| M | 50% | 84.0% | 3 | BCA-603 CO4 | Carry out testing of software though automation testing tools | 2 | 2 | 3 | 3 | 3 |
| M | 50% | 78.0% | 2 | BCA-604 CO1 | Understand the functionality of the various data mining and data-warehousing component. Appreciate the strengths and limitations of various data mining and data warehousing models. | 2 | 2 | 2 | | 1 |
| E | 60% | 66.0% | 1 | BCA-604 CO2 | Explain the analysing techniques on various data-mining primitives. | 2 | 2 | 1 | | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|
| H | 40% | 84.0% | 3 | BCA-604 CO3 | Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering. | 3 | 3 | 2 | | 2 |
| M | 50% | 66.0% | 1 | BCA-604 CO4 | Develop skill in selecting the appropriate data-mining algorithm for solving practical problems | 2 | 2 | 3 | | 2 |
| E | 60% | 100.0% | 3 | BCA-605 CO1 | Design and implement Web application using ASP.net | 1 | 3 | 1 | 1 | 3 |
| E | 60% | 100.0% | 3 | BCA-606 CO1 | Design and implement android based mobile applications. | 1 | 2 | 1 | 1 | 3 |
| | | | | | | **211** | **220** | **219** | **156** | **276** |
| | | | | | | | | | | |
| | | | 100% | BCA 101 CO1 | Enhance the learner's communication skills by giving adequate exposure in listening, speaking, reading and writing skills and the related sub-skills. Recognize and operate in various styles and registers in English. | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA 101 CO2 | Identify and repair the voids in his present vocabulary and pronunciation targeting those specific arrays of words, which create a barrier in his thought process. | 0 | 0 | 0 | 3 | 2 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA 101 CO3 | Boost confidence in oral and interpersonal communication by reinforcing the basics of pronunciation specially focusing on interviews/ corporate meetings/ international business travels. | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA 101 CO4 | Achieve adequate linguistic skills to students compete well in international certification tests of English such as IELTS and TOEFL | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA-102 CO1 | Understand the concepts of logic gates, Different Digital Circuit. Explain different number systems and apply to create representation of numbers in computers | 2 | 2 | 1.333333333 | 0 | 3 |
| | | | 0% | BCA-102 CO2 | Describe the organization of computer and its design | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 0% | BCA-102 CO3 | Understand the basics of computer architecture | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 33% | BCA-102 CO4 | Examine the organization of various types of memories and I/O organization. | 0.666666667 | 0.666666667 | 1.333333333 | 0 | 1 |
| | | | 67% | BCA-103 CO1 | Understand the problem solving constructs and techniques through flowcharts. Understand concepts of tokens and predefined functions of C language | 1.333333333 | 1.333333333 | 1.333333333 | 0 | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | BCA-103 CO2 | Understand and apply control statements and arrays to solve problems for Computers | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 100% | BCA-103 CO3 | Create modular program using functions and utilize various storage class | 2 | 2 | 1.333333333 | 0 | 3 |
| | | | 33% | BCA-103 CO4 | Understand and apply pre-processor directives, structures, and union in solving problems | 0.666666667 | 0.666666667 | 1.333333333 | 0 | 1 |
| | | | 67% | BCA-104 CO1 | Understand the key concept of successive differentiation and apply them to solve various Problems. Describe concept of Partial derivatives and its applications. | 2 | 1.333333333 | 3 | 0.6666667 | 1.333333333 |
| | | | 33% | BCA-104 CO2 | Analyse the concept of Envelope Evolutes, maxima, and minima for the function of two variables. | 1 | 1 | 2 | 0.3333333 | 0.666666667 |
| | | | 67% | BCA-104 CO3 | Understand to apply Beta and Gamma function to simplify integration. | 1.333333333 | 1.333333333 | 1.333333333 | 0.6666667 | 1.333333333 |
| | | | 67% | BCA-104 CO4 | Apply integration to calculate the area and volume of different types of curve. | 2 | 1.333333333 | 2 | 0.6666667 | 1.333333333 |
| | | | 100% | BCA-105 CO1 | To Apply Basics of C-Language like, Variables, Control Statements, Arrays, Structures and pointers in developing programs. | 1 | 3 | 0.666666667 | 0 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA-106 CO1 | Proficiently use Microsoft Word to create, format, and edit various types of documents. and Effectively manipulate data in Microsoft Excel for tasks ranging from basic calculations to complex data analysis. | 3 | 1 | 2 | 0 | 3 |
| | | | 100% | BCA-201 CO1 | To use basic English Grammar in verbal and non-verbal communication. To understand and implement effective listening, reading, writing and Speaking Skills in day-to-day activities | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA-201 CO2 | Demonstrate the effective presentation skills | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA-201 CO3 | To use process of formal communication | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA-201 CO4 | To illustrate various formats used in business writing & the use of external aids involved in effective presentation | 0 | 0 | 0 | 3 | 2 |
| | | | 100% | BCA-202 CO1 | Understand and identify potential benefits of Object-oriented programming over other approaches. Understand and apply object- oriented programming concept like class & object to develop solutions of the problems. | 3 | 3 | 2 | 1 | 3 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA-202 CO2 | Apply the concept of polymorphism by overloading the operator and functions in solving the real-world problem | 2 | 2 | 2 | 1 | 3 |
| | | | 100% | BCA-202 CO3 | Create the classes through the concept of inheritance to achieve modularity by reusing the exiting code | 2 | 2 | 2 | 1 | 3 |
| | | | 100% | BCA-202 CO4 | Implement data persistence through file handing. | 0 | 0 | 0 | 2 | 3 |
| | | | 0% | BCA-203 CO1 | Understand the basic concepts of data structure and particulate linear data structures and permitted operations. Understand and apply linked list data structure for solving problems | 0 | 0 | 0.666666667 | 0 | 0 |
| | | | 0% | BCA-203 CO2 | Articulate the tree data structures and permitted operations | 0 | 0 | 1 | 0 | 0 |
| | | | 0% | BCA-203 CO3 | Articulate the graph data structures and permitted operations | 0 | 0 | 1 | 0 | 0 |
| | | | 0% | BCA-203 CO4 | Implement Searching and Sorting algorithms & Understand the concepts of file organization Techniques | 0 | 0 | 0.666666667 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA-204 CO1 | Understand the concept of differential equations of first order and first degree and its various methods. Analyse concept of linear differential equations of higher order with constant coefficients. | 3 | 3 | 3 | 1 | 2 |
| | | | 100% | BCA-204 CO2 | Analyse the formulation and classification of Partial Differential Equations. | 3 | 3 | 3 | 1 | 2 |
| | | | 100% | BCA-204 CO3 | Apply the methods to solve linear PDE of higher order and its application. | 3 | 3 | 2 | 1 | 2 |
| | | | 100% | BCA-204 CO4 | Understand the concept of Bessel and Legendre functions and derive recurrence relations. | 3 | 2 | 2 | 1 | 2 |
| | | | 100% | BCA-205 CO1 | Design and implement Object Oriented program in C++ by using various features like class, object, inheritance and polymorphism etc. | 2 | 3 | 1.333333333 | 2 | 3 |
| | | | 100% | BCA-206 CO1 | Apply various data structures to design efficient solutions of real-world problems. | 1 | 3 | 0.666666667 | 0 | 3 |
| | | | 33% | BCA-301 CO1 | Understand the Database concepts, DBMS software and supported architecture. Design and implement databases using concepts of data models | 0.666666667 | 0.333333333 | 0.666666667 | 0.3333333 | 0.666666667 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 33% | BCA-301 CO2 | Analyze databases using normal forms for reducing redundancy. | 0.666666667 | 0.333333333 | 0.666666667 | 0.3333333 | 0.666666667 |
| | | | 67% | BCA-301 CO3 | Create SQL and relational algebra expressions to retrieve and manage database. | 1.333333333 | 0.666666667 | 0.666666667 | 0.6666667 | 1.333333333 |
| | | | 67% | BCA-301 CO4 | Implement transaction processing and concurrency control concepts. | 1.333333333 | 0.666666667 | 0.666666667 | 0.6666667 | 1.333333333 |
| | | | 33% | BCA-302 CO1 | Understand the basics of different display device and input device. Implement line drawing and fill algorithms | 1 | 0.666666667 | 2 | 0.3333333 | 0.333333333 |
| | | | 33% | BCA-302 CO2 | Implement different clipping algorithm | 1 | 0.666666667 | 2 | 0.3333333 | 0.333333333 |
| | | | 0% | BCA-302 CO3 | Understand and use various geometric transformation | 0 | 0 | 0.666666667 | 0 | 0 |
| | | | 100% | BCA-302 CO4 | Explain the concept of multimedia | 1 | 1 | 0.333333333 | 2 | 2 |
| | | | 0% | BCA-303 CO1 | To learn the fundamentals of OS, gain the knowledge on the basics of instruction execution, processor registers and how components of system communicate with each other. : To learn the concept of process and how OS manages processors and memory. | 0 | 0 | 1.333333333 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 33% | BCA-303 CO2 | To gain knowledge about the mechanisms of OS for synchronizing processes and understanding various problems of synchronization. | 0.666666667 | 1 | 2 | 1 | 0.666666667 |
| | | | 67% | BCA-303 CO3 | To learn the concept of deadlocks and various algorithms for handling deadlocks. | 1.333333333 | 1.333333333 | 1.333333333 | 2 | 2 |
| | | | 0% | BCA-303 CO4 | To understand various memory management techniques implemented by OS. | 0 | 0 | 2 | 0 | 0 |
| | | | 0% | BCA-304 CO1 | Understand the key concept of proposition, set theory and its various types. Understand the concept of Relation and function and its various kinds | 0 | 0 | 2 | 0 | 0 |
| | | | 0% | BCA-304 CO2 | Apply Boolean expression representing circuits and analyse the different aspects of graphs. | 0 | 0 | 3 | 0 | 0 |
| | | | 33% | BCA-304 CO3 | Understand the concept of matrix to evaluate rank and nullity of matrix. | 1 | 0.666666667 | 3 | 0.6666667 | 1 |
| | | | 67% | BCA-304 CO4 | Evaluate Eigen value and Eigen vector and to solve simultaneous equation by matrix. | 2 | 1.333333333 | 3 | 1.3333333 | 2 |
| | | | 100% | BCA-305 CO1 | Design and implement Web application using VB.net | 1 | 3 | 0.666666667 | 0 | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA-306 CO1 | Write SQL statements for creating and manipulating databases using RDBMS. | 1 | 2 | 0.666666667 | 1 | 3 |
| | | | 100% | BCA-307 CO1 | Creating and manipulating various basic building blocks of Computer graphics. | 2 | 3 | 1.333333333 | 1 | 3 |
| | | | 100% | BCA-308 CO1 | Design and implement window application using VB. Net | 1 | 3 | 0.666666667 | 2 | 2 |
| | | | 0% | BCA-401 CO1 | Understand the use and key concept of HTML, CSS, JavaScript. Understand and apply features of JavaScript and Jquery for event handling | 0 | 0 | 2 | 0 | 0 |
| | | | 0% | BCA-401 CO2 | Apply basic features of PHP for creating dynamic webpages | 0 | 0 | 2 | 0 | 0 |
| | | | 33% | BCA-401 CO3 | Use control statement, array, regular expression of PHP in webpage creation. | 0.666666667 | 0.666666667 | 2 | 0.3333333 | 1 |
| | | | 0% | BCA-401 CO4 | Create webpages for database handling through MySQL | 0 | 0 | 0 | 0 | 0 |
| | | | 0% | BCA-402 CO1 | Explain the basics of java language and Apply OOPs concept in solving the real problem | 0 | 0 | 2 | 0 | 0 |
| | | | 33% | BCA-402 CO2 | Able to Use of package and collection frame work for solving the problem | 0.666666667 | 0.666666667 | 1.333333333 | 0.6666667 | 0.666666667 |
| | | | 0% | BCA-402 CO3 | To develop the robust and high performance system | 0 | 0 | 1 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | BCA-402 CO4 | Develop GUI and Event handling application | 0 | 0 | 1 | 0 | 0 |
| | | | 100% | BCA-403 CO1 | Explain Software development Life cycle models. Create SRS and asses the efforts required to develop software | 2 | 2 | 1.333333333 | 3 | 3 |
| | | | 100% | BCA-403 CO2 | Understand software design fundamentals | 3 | 3 | 2 | 3 | 3 |
| | | | 100% | BCA-403 CO3 | Design software by applying different techniques | 3 | 3 | 3 | 3 | 3 |
| | | | 100% | BCA-403 CO4 | Explain concepts of software measures, Software testing, reverse engineering, UML | 3 | 3 | 2 | 3 | 3 |
| | | | 0% | BCA-404 CO1 | Understand the concept of approximate numbers, errors in numbers, zeroes or roots of polynomial and/or transcendental equations, difference operators and statistical terms. Apply Iterative techniques to solve polynomial and/or transcendental equations and simultaneous linear equations | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 0% | BCA-404 CO2 | Apply mathematical relationships for given observations of the variable using Interpolation techniques. | 0 | 0 | 0.666666667 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 33% | BCA-404 CO3 | Analyse statistical data using measures of central tendency, dispersion, skewness and Kurtosis. | 0.666666667 | 0.666666667 | 1.333333333 | 0.3333333 | 0.666666667 |
| | | | 0% | BCA-404 CO4 | Understand the concept of correlation and simple linear regression analysis for a set of data | 0 | 0 | 1 | 0 | 0 |
| | | | 100% | BCA-405 CO1 | Develop solutions for basic problems using various features of Python | 2 | 3 | 2 | 2 | 3 |
| | | | 100% | BCA-406 CO1 | Design and implement web application using HTML, CSS, JavaScript and PHP. | 1 | 3 | 0.666666667 | 2 | 3 |
| | | | 100% | BCA-407 CO1 | Design and implement Object oriented programs using various features of Java Programming language. | 1 | 3 | 1 | 1 | 3 |
| | | | 100% | BCA-408 CO1 | Design and implement web application for solving real world problems. | 2 | 3 | 1.333333333 | 2 | 3 |
| | | | 0% | BCA-501 CO1 | To understand and build web application using MVC model. To perform database operation in web application through JDBC | 0 | 0 | 2 | 0 | 0 |
| | | | 33% | BCA-501 CO2 | Apply servlet API to develop dynamic web application | 0.666666667 | 1 | 2 | 0.6666667 | 1 |
| | | | 33% | BCA-501 CO3 | Apply JSP API to develop dynamic web application | 0.666666667 | 1 | 2 | 0.6666667 | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | BCA-501 CO4 | Use java beans in web application development | 0 | 0 | 2 | 0 | 0 |
| | | | 100% | BCA-502 CO1 | Define and understand basic working of computer network and its components. Apply and Understand the Analog and Digital data transmission and transmission impairments | 2 | 3 | 0.666666667 | 2 | 2 |
| | | | 100% | BCA-502 CO2 | Understand the basic concept of OSI and TCP reference model | 2 | 3 | 1.333333333 | 3 | 3 |
| | | | 100% | BCA-502 CO3 | Understand, define and analyse the basics of ISDN, ATM data link services and standard data link layer protocols | 2 | 2 | 1.333333333 | 3 | 2 |
| | | | 0% | BCA-502 CO4 | Understand, identify and adapt the basic concept of IEEE standards protocols and networking devices for communications. | 0 | 0 | 2 | 0 | 0 |
| | | | 0% | BCA-503 CO1 | Demonstrate fundamental understanding of the AI history and its foundations.Understand elements constituting problems and learn to solve it by various uninformed and informed (heuristics based) searching techniques | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 0% | BCA-503 CO2 | Understand different methods of knowledge representation and reasoning. | 0 | 0 | 1.333333333 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | BCA-503 CO3 | Be able to describe and apply the artificial neural network models and their learning algorithms in solving problems | 0 | 0 | 1.333333333 | 0 | 0 |
| | | | 33% | BCA-503 CO4 | CO4:Be able to describe different activation function, regularization techniques, Fuzzy Sets and Fuzzy Logic | 0.666666667 | 0.666666667 | 1.333333333 | 0 | 0.666666667 |
| | | | 100% | BCA-504 CO1 | Design and implement solutions of real world problems using suitable technology. | 2 | 3 | 1.333333333 | 2 | 3 |
| | | | 100% | BCA-505 CO1 | Design and implement MVC based web application using servlet, JSP and java beans. | 1 | 3 | 0.666666667 | 1 | 3 |
| | | | 100% | BCA-506 CO1 | Develop programs in Oracle using PL/SQL. | 1 | 2 | 0.666666667 | 1 | 3 |
| | | | 33% | BCA-601 CO1 | Understand basics of C # programming language. Implement solutions for problems in C #. | 1 | 0.666666667 | 3 | 0.6666667 | 0.666666667 |
| | | | 67% | BCA-601 CO2 | Design and implement web forms in Asp.net. | 2 | 2 | 3 | 1.3333333 | 2 |
| | | | 100% | BCA-601 CO3 | Design and implement web forms with validation in Asp.net | 3 | 3 | 3 | 2 | 3 |
| | | | 100% | BCA-601 CO4 | Create web forms for performing CURD operations on databases in Asp.net. | 3 | 2 | 3 | 2 | 3 |
| | | | 33% | BCA-602 CO1 | To understand Linux features and commands and to understand mobile OS | 0.666666667 | 0.666666667 | 2 | 0.6666667 | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0% | BCA-602 CO2 | to understand architecture of android OS | 0 | 0 | 2 | 0 | 0 |
| | | | 100% | BCA-602 CO3 | to understand android framework and their components | 1 | 2 | 1 | 3 | 3 |
| | | | 33% | BCA-602 CO4 | To develop mobile app in android device | 0.666666667 | 0.666666667 | 2 | 1 | 1 |
| | | | 67% | BCA-603 CO1 | Understand the fundamental concepts of software testing. Design the test cases though different black box testing techniques | 1.333333333 | 1.333333333 | 2 | 1.3333333 | 2 |
| | | | 67% | BCA-603 CO2 | Design the test cases though different white box testing techniques | 1.333333333 | 1.333333333 | 2 | 1.3333333 | 2 |
| | | | 100% | BCA-603 CO3 | Understand and Appreciate the importance of different levels of testing | 2 | 2 | 2 | 3 | 3 |
| | | | 100% | BCA-603 CO4 | Carry out testing of software though automation testing tools | 2 | 2 | 2 | 3 | 3 |
| | | | 67% | BCA-604 CO1 | Understand the functionality of the various data mining and data-warehousing component. Appreciate the strengths and limitations of various data mining and data warehousing models. | 1.333333333 | 1.333333333 | 1.333333333 | 0 | 0.666666667 |
| | | | 33% | BCA-604 CO2 | Explain the analysing techniques on various data-mining primitives. | 0.666666667 | 0.666666667 | 0.666666667 | 0 | 0.333333333 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | 100% | BCA-604 CO3 | Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering. | 3 | 3 | 2 | 0 | 2 |
| | | | 33% | BCA-604 CO4 | Develop skill in selecting the appropriate data-mining algorithm for solving practical problems | 0.666666667 | 0.666666667 | 2 | 0 | 0.666666667 |
| | | | 100% | BCA-605 CO1 | Design and implement Web application using ASP.net | 1 | 3 | 0.333333333 | 1 | 3 |
| | | | 100% | BCA-606 CO1 | Design and implement android based mobile applications. | 1 | 2 | 0.333333333 | 1 | 3 |
| | | | | | SUM | **112.7** | **131.3** | **155.7** | **106.0** | **164.3** |
| | | | | | PO Attainment % | 53% | 60% | 71% | 68% | 60% |
| | | | | | PO Attainment out of 3 | **1.6** | **1.8** | **2.1** | **2.0** | **1.8** |