**Post Graduate Government College for Girls, Sector-42, Chandigarh**

**Teaching Plan for Bachelors (Third and Fifth Semester) and Post Graduate (Third Semester)**

**Session (2020-2021)**

**Class: BCA II (3rd Semester) Name of the Teacher: Nidhi Goyal**

**Subject: Computer Oriented Numerical Methods Paper: BCA-16-304**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Dates** | **Topics to be Covered** |
| Week 1 | 03/08/2020 – 08/08/2020 | Introduction to differentiation, integration and matrix algebra. |
| Week 2 | 10/08/2020 – 14/08/2020 | Introduction, Types of Non-Linear Equations: Polynomial Equations, Transcendental Equations, Methods of Finding Solutions of Non-Linear equations: Direct Method, Iterative Method. |
| Week 3 | 17/08/2020 – 22/08/2020 | Iterative Methods: Bisection Method, False-Position Method |
| Week 4 | 24/08/2020 – 29/08/2020 | Secant Method, Newton - Raphson Methods, Zeros of a polynomial using Birge – Vieta Method. Convergence of Iterative Methods, |
| Week 5 | 31/08/2020- 05/09/2020 | Simultaneous Linear Equations: Solution of Simultaneous Linear Equations using Direct and Iterative Methods: Direct Methods: Gauss – Elimination Method |
| Week 6 | 07/09/2020- 12/09/2020 | Gauss-Jordan Method, Concept of Pivoting, Iterative Method: Gauss-Seidal Method |
| Week 7 | 14/09/2020- 19/09/2020 | Introduction to differentiation, integration and matrix algebra. |
| Week 8 | 21/09/2020- 26/09/2020 | Data Representation and Computer Arithmetic: Introduction, Concept of Exact and Approximate Numbers, Concept of Significant digits, Representation of Numbers in Memory, Storage of Integer Numbers: Signed Representation, 1’s Complement Representation, 2’s Complement Representation, Floating Point Numbers and their storage, |
| Week 9 | 28/09/2020- 03/10/2020 | Floating Point Arithmetic, Normalization and their consequences |
| Week 10 | 05/10/2020- 10/10/2020 | Errors, Measures of Accuracy: Absolute Error, Relative Error and Percentage Error, Error types: Data Errors, Truncation Errors, Round-Off Errors, Computational Errors, Rules, Relationship between Relative Error and Significant digits and Error Propagation: Error Propagation in Addition Operation, Subtraction Operation, Multiplication Operation and Division Operation. |
| Week 11 | 12/10/2020- 16/10/2020 | Numerical Integration: Introduction, Newton-Cotes Integration Formulae: Trapezoidal Rule, Simpson’s 1/3rd Rule, Simpson’s 3/8th Rule. |
| Week 12 | 19/10/2020- 24/10/2020 | Solution of Ordinary Differential Equations: Introduction, Euler’s Method, Runga–Kutta Methods: 2nd order & 4th order |
| Week 13 | 27/10/2020- 30/10/2020 | Predictor Corrector Methods: Modified Euler’s Method. |
| Week 14 | 03/11/2020- 07/11/2020 | Approximation: Approximation of functions: Taylor Series Representation, Chebyshev Polynomials. |
| Week 15 | 09/11/2020- 12/11/2020 | Interpolation: Introduction, Lagrange Interpolation, Inverse Interpolation, Finite Differences: Forward Differences, Backward Differences, Divided Differences, Difference Tables: Forward Difference Table, Backward Difference Table, Divided Difference Table, Observations regarding Difference Tables, |
| Week 16 | 16/11/2020- 21/11/2020 | Newton’s Method of Interpolation: Newton’ s Forward Difference Interpolation Formula, Newton’ s Divided Difference Interpolation Formula. |
| Week 17 | 23/11/2020- 28/11/2020 | Revision of Syllabus |

**Class: BCA III (5th Semester) Name of the Teacher: Nidhi Goyal**

**Subject: Discrete Mathematical Structure Paper: BCA-16-502**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Dates** | **Topics to be Covered** |
| Week 1 | 03/08/2020 – 08/08/2020 | Introduction to set theory. |
| Week 2 | 10/08/2020 – 14/08/2020 | Set Notation and Description, subset, basic set operations |
| Week 3 | 17/08/2020 – 22/08/2020 | Venn Diagrams, laws of set theory, partitions of sets |
| Week 4 | 24/08/2020 – 29/08/2020 | min sets, max sets, duality principle, Numerical implementations of set theory |
| Week 5 | 31/08/2020- 05/09/2020 | Graph Theory : Graph and planar graphs – Basic Terminology, Multi-graphs |
| Week 6 | 07/09/2020- 12/09/2020 | Weighted Graphs, Paths and Circuits |
| Week 7 | 14/09/2020- 19/09/2020 | Shortest Paths, Eulerian Paths and Circuits |
| Week 8 | 21/09/2020- 26/09/2020 | Travelling Salesman Problem, Planar Graphs |
| Week 9 | 28/09/2020- 03/10/2020 | Recurrence : Recurrence Relations and Recursive Algorithms – Linear-Recurrence Relations with Constant Coefficient |
| Week 10 | 05/10/2020- 10/10/2020 | Homogeneous Solutions : Particular Solution, Total Solution |
| Week 11 | 12/10/2020- 16/10/2020 | Non-Homogeneous Solutions : Particular Solution, Total Solution |
| Week 12 | 19/10/2020- 24/10/2020 | Solution by the Method of Generating functions. |
| Week 13 | 27/10/2020- 30/10/2020 | basic definitions of relations and functions, graphics of relations |
| Week 14 | 03/11/2020- 07/11/2020 | properties of relations: injective, surjective and bijective functions, compositions. |
| Week 15 | 09/11/2020- 12/11/2020 | Automata Theory : Finite State Machines–Equivalent Machines, Finite State Machines as language Recognizers |
| Week 16 | 16/11/2020- 21/11/2020 | Analysis of Algorithms - Time Complexity, Complexity of Problems. |
| Week 17 | 23/11/2020- 28/11/2020 | Revision of Syllabus |