| Semester –V | | | |
|---|---|---|---|
| **Part III** | **Core VII (Common Core) Computer Oriented Numerical Methods** | | |
| **Code: 18UCCC51** | **Hrs/Week: 6** | **Hrs/ Semester : 90** | **Credits : 4** |

**Vision:**

To inspire the students with modern computational methods to carry out the problems.

**Mission:**

To equip students with the knowledge of algorithms of numerical analysis and execute it efficiently with MATLAB.

**Course Outcome:**

| CO. No. | Upon completion of this course, students will be able to | PSO addressed | CL |
|---|---|---|---|
| CO-1 | find numerical solution of a problem in all aspects and apply these methods to practical implementation as reliable and efficient. | 3 | Re |
| CO-2 | recognize and apply appropriate principles and concept relevant to numerical analysis. | 5 | Ap |
| CO-3 | discover the most appropriate estimate for the missing data. | 1 | Cr |
| CO-4 | analyze the errors obtained in the numerical solutions of problems. | 6 | An |
| CO-5 | use appropriate numerical methods, determine the solutions to given problems. | 3 | Ap |
| CO-6 | demonstrate the use of the interpolation method to find the solution for the data. | 8 | Un |
| CO-7 | develop their calculation skills. | 1 | Cr |
| CO-8 | differentiate gauss jacobi iteration and gauss seidal iteration method. | 3 | An |

| Semester –V | | | |
|---|---|---|---|
| **Part III Core VII (Common Core) Computer Oriented Numerical Methods** | | | |
| **Code: 18UCCC51** | **Hrs/Week: 6** | **Hrs/Semester: 90** | **Credits: 4** |

**Unit I**

Difference operators-Other difference operators-Newton's interpolation formula-Lagrange's interpolation formulae-Divided difference-Divided difference formula-Inverse interpolation.

**(Textbook: 1, Chapter 3, Sec 3.1, 3.2, Chapter 4, Sec 4.1,4.3,4.4,4.5,4.6, pages 3.1 – 3.45, 4.1- 4.16, 4.31- 4.54)** (Problems only)

**Unit II**

Derivatives using Newton's forward difference formula-Derivatives using Newton's backward difference formula-Derivatives using Newton's central difference formula-Maxima and minima of the interpolating Polynomial-Numerical Integration-Newton – Cote's quadrature formula-Trapezoidal Rule-Simpson's one third rule-Simpson's three eighth rule-Weddley's rule.

**(Textbook: 1, Chapter 5, Sec 5.1 – 5.4, Chapter 6, Sec 6.1 – 6.4, pages 5.1 – 5. 24, 6.1 – 6.26)** (Problems only)

**Unit III**

Taylor series method-Picard's method- Runge-Kutta method.

**(Textbook: 1, Chapter 7, Sec 7.1,7.2,7.4, pages 7.1-7.15, 7.25-7.40)** (Problems only)

**Unit IV**

Introduction to MATLAB: MATLAB environment – Types of files _ platform – search path – Constants, variables and expressions – Vectors and Matrices – Polynomials – Input Output statements – MATLAB Graphics.

**(Textbook:2, Chapters:1,2,3,4,5,6)**

**Unit V**

Control Structures- writing programs and functions – ordinary differential equation and symbolic mathematics – MATLAB Applications.

**(Textbook: 2, Chapters: 7,8,9,10)**

**Text Books**

1.Arumugam S and Thangapandi Isaac A, Numerical Analysis With Programming in C, New Gamma Publishing House, Palayamkottai.

2.Raj Kumar Bansal, Ashok Kumar Goel, Manoj Kumar Sharma, MATLAB and its Applications in engineering, Pearsons Publications.

**Books for Reference**

1.Stormy Attaway, MATLAB- A Practical Introduction to Programming and Problem Solving.
2.Stephen J. Chapman, Essentials of MATLAB Programming, Published November 1st 2007 by Thomson Learning.

| Semester – V | | | |
|---|---|---|---|
| **Part III Core Integral II Statistical Inference** | | | |
| **Code :18UMAI52** | **Hrs/week :4** | **Hrs/Semester :60** | **Credits :4** |

**Vision**

It gives the knowledge of statistical quality control techniques and their applications

**Mission**

To apply the statistical techniques in their work stations

**Course Outcome**

| CO.No. | Upon completion of this course, students will be able to | PSO addressed | CL |
|---|---|---|---|
| CO-1 | understand the uses of statistical quality control. | 1 | Un |
| CO-2 | compute the upper and lower control limits for different chart | 3 | Ev |
| CO-3 | analyse the usage of different charts. | 8 | Cr, Ap |
| CO-4 | know type I and type II error | 1 | Cr |
| CO-5 | classify the different test static | 5 | Un, Ap |
| CO-6 | check the difference between small and large samples. | 1 | Ap |
| CO-7 | evaluate t-test, F-test etc | 3, 7 | Ap |
| CO-8 | apply the correct test static | 4 | Ap |

| Semester – V | | | |
|---|---|---|---|
| **Part III Core Integral II Statistical Inference** | | | |
| **Code :18UMAI52** | **Hrs/week :4** | **Hrs/Sem :60** | **Credits :4** |

**Unit I**

Statistical Quality Control - Definition, Advantages, Process control - Control chart, Mean chart, Range chart

**(Text Book1: Vol.2, Chapter 7, Pages1051-1074)**

**Unit II**

Control chart for standard Deviation, Control chart for C, Control chart for P ,np- chart

**(Text Book1: Vol.2, Chapter 7, Pages 1082-1091)**

**Unit III**

Testing of hypothesis - Null and Alternate Hypothesis. Type I and Type II errors - Critical region, level of significance - Test of significance for large samples - Testing a single proportion - Difference of proportions - testing a single mean - Difference of means.

**(Text Book1: Vol.2, Chapter 3, Pages 882 – 908)**

**Unit IV**

Tests based on t - distribution - Single mean - Difference of means - Tests based on F distribution - Variance ratio test - Test based on chi square distribution - Independence - Goodness of fit. (excluding the test for correlation)

**(Text Book1: Chapter 3- 4, Pages 910 – 920, 954 – 970, 1006-1009)**

**Unit V**

Analysis of Variance - One way and two way classified data - Basis of experimental design - simple problems.

(**Text Book2: chapter 17 pages 481 – 506)**

**Text Books**

1.Gupta S.P., Statistical Method , 44-th edition Sultan Chand & Sons Publishers-New Delhi.

2.Arumugam S. and Issac A., Statistics, New Gamma publishing House. Palayamkottai, 2016.

**Books for Reference**

1. Gupta S.C., Kapoor V.K., Fundamentals of mathematical Statistics , Eleventh edition, Sultan Chand & Sons, Educational Publishers, New Delhi

2. Sancheti D.C, Kapoor V.K., Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi