

Numerical Methods-MATH-21402

Book: Numerical Methods for Scientists and Engineers By K Sankara Rao

Outlines of Course upto Mid-Term

A. Already discussed/done in regular classes

- i) Numerical Differentiation
 - Introduction to numerical differentiation
 - Derivation of numerical differentiation formulae using Forward, Backward and Central Differences Operators plus solved and unsolved questions from book
 - Two and Three-points formulae of numerical differentiation with examples
 - Differentiation using interpolation with examples
 - Richardson's extrapolation method for differentiation plus solved and unsolved problems from book

B. Currently ongoing course outlines through whatsapp groups/online discussion

- i) Numerical Integration
 - Introduction and purpose of numerical integration
 - Derivation of Newton-Cotes integration formulae with error term
 - Derivation of Trapezoidal rule and composite form of Trapezoidal rule with solved and unsolved questions
 - Derivation of Simpson's $1/3$ and $3/8$ rules and composite forms of Simpson's rules with solved and unsolved questions
- ii) Description of double numerical integration with solved and unsolved questions