

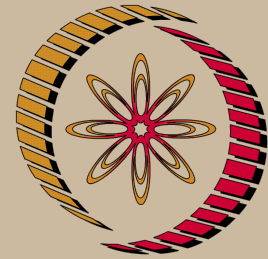
# Foundation of Scientific Computing - Video course

## COURSE OUTLINE

The course covers lessons in Foundation of Scientific Computing ,Quantum computing,Wentzel-Kramer-Brillouin Method, Runge-Kutta method, Trapezoidal method , Quasi-linear, Laplace equation,wave packets, Pressure fluctuation ,linearized shallow water wave equation, 1D convection equation,Upwinding ,Numerical amplification factor ,Parabolic partial differential equation , Elliptic partial differential equations ,Lagrange and hermite interpolations .

## COURSE DETAIL

| S.No | Topic                                   |
|------|---|
| 1    | Foundation of Scientific Computing      |
| 2    | Quantum computing                       |
| 3    | Wentzel-Kramer-Brillouin Method         |
| 4    | Runge-Kutta method                      |
| 5    | Trapezoidal method                      |
| 6    | Quasi-linear                            |
| 7    | Laplace equation                        |
| 8    | wave packets                            |
| 9    | Pressure fluctuation                    |
| 10   | wave phenomena                          |
| 11   | linearized shallow water wave equation  |
| 12   | 1D convection equation                  |
| 13   | Upwinding                               |
| 14   | Numerical amplification factor          |
| 15   | Stiff differential equation.            |
| 16   | Numerical amplification factor          |
| 17   | Heat equation                           |
| 18   | Parabolic partial differential equation |
| 19   | Tridiagonal matrices                    |
| 20   | Error propagation                       |
| 21   | Elliptic partial differential equations |
| 22   | Ordinary differential equation          |
| 23   | Convergence properties                  |
| 24   | General elliptic equation               |
| 25   | Multigrid method                        |



NP-TEL

# NPTEL

<http://nptel.ac.in>

## Aerospace Engineering

**Coordinators:**

**Prof. Tapan K. Sengupta**  
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|----|---|
| 26 | Spectral analysis of explicit and implicit    |
| 27 | Highlight the scientific and high performance |
| 28 | Taylor series analysis                        |
| 29 | Buffer domain technique                       |
| 30 | Aliasing error                                |
| 31 | Accuracy compact schemes                      |
| 32 | CCD scheme                                    |
| 33 | Stabilizing effects of filters                |
| 34 | Properties of filters                         |
| 35 | Scientific elements of a FEM                  |
| 36 | Lagrange and hermite interpolations           |
| 37 | Elliptic equation with linear basis function  |

