



# SCIENTIFIC COMPUTING USING MATLAB

**Prof. Mani Mehra**  
Department of Mathematics  
IIT Delhi

**TYPE OF COURSE** : New | Core | UG/PG  
**COURSE DURATION** : 12 weeks (20 Jul' 20 - 9 Oct' 20)  
**EXAM DATE** : 17 Oct 2020

**Prof. Vivek K. Aggarwal**  
Department of Applied Mathematics  
IIT Delhi

**PRE-REQUISITES** : Some knowledge of any programming language

**INTENDED AUDIENCE** : UG/PG students

**COURSE OUTLINE :**

In the first week of this course, an introduction to Matlab is introduced with hands on Matlab software. In the subsequent weeks, topics will be introduced followed by hands on to write the Matlab code of the same topics. This course is very useful for the students who wants to do research projects using numerical techniques to handle data or to solve differential equations.

**ABOUT INSTRUCTOR :**

Prof. Mani Mehra is presently working as an Associate Professor in the department of Mathematics, IIT Delhi. She earned her PhD from IIT Kanpur in 2005.

Prof. Vivek Kumar Aggarwal in presently worked as an Assistant Professor dept. of Applied Mathematics, DTU Delhi. He earned his PhD in Mathematics from IIT Kanpur in 2005.

**COURSE PLAN :**

**Week 1:** Introduction to Matlab

**Week 2:** Error estimation and methods of roots finding

**Week 3:** Solving System of Linear Algebraic equations

**Week 4:** Curve fitting and Interpolation

**Week 5:** Numerical differentiation

**Week 6:** Numerical Integration

**Week 7:** Numerical Optimization

**Week 8:** Problem solving session

**Week 9:** Numerical solution of Initial value problems (IVP)

**Week10:** Discussion about Convergence of numerical schemes

**Week 11:** Numerical solution of Boundary value problems (BVP)

**Week 12:** Discussion and Problem-solving session