Information of the course on **Advanced PDEs (MA717)** at IIT Ropar, India

Course contents:

- Review of basics of functional analysis and Lebesgue integrals, L^p-spaces and their properties, distribution theory, convolution and Fourier transform.
- **Sobolev spaces:** Definition and examples, approximation and extension properties, Sobolev embedding theorems, Poincaré inequality, Fractional order Sobolev spaces and trace theorem.
- **Elliptic PDEs:** Existence of weak solution to elliptic boundary value problems, maximum principle and regularity results.

Class and tutorial timings for the course:

- Monday, 5:00 PM to 6:30 PM
- Tuesday, 5:00 PM to 6:30 PM
- Wednesday, 5:00 PM to 6:00 PM (Tutorial)

Credit system for the course:

- 10 marks for homework assignments.
- 10 marks for project report and presentation.
- 15 marks for class tests. There will be two class tests of equal marks each.
- 25 marks for mid-sem exam. Mid-sem exam will be as per institute schedule.
- 40 marks for end-Sem exam. End-sem exam will be as per institute schedule. End-sem exam will contain the whole syllabus, taught during the course.

Grading and attendance policy:

1. There will be relative grading with a minimum threshold for A (Outstanding), D(Marginal) and NP (the Audit pass) grades as per the criteria given below.
   (a) The minimum percentage for the award of an "A"grade is 80%.
   (b) The minimum percentage for the award of "D"grade is 30%.
   (c) The Audit Pass "NP"is awarded if the student's attendance is above 75% in the class and he/she has obtained at least a "C-"grade.
2. Attendance policy is as per institute rules.

Note: Based on circumstances above evaluation scheme may change.

References for the course:

1. Introduction to PDEs by Gerald B. Folland.
2. Partial Differential Equations by Lawrence C. Evans.
3. Partial Differential Equations in Action by Sandro Salsa.
4. Measure theory and fine properties of functions by Lawrence C. Evans and Ronald F. Gariepy.