

Partial Differential Equations

SWAYAM Prabha Course Code: S10

PROFESSOR'S NAME	Prof. Asish Ganguly, Prof. H S Mahato
DEPARTMENT	Mathematics
INSTITUTE	IIT Kharagpur
COURSE OUTLINE	<p>Apply a range of techniques to find solutions of standard Partial Differential Equations (PDE). Understand basic properties of standard PDE's. Demonstrate accurate and efficient use of Fourier series expansion techniques and their applications in the theory of PDE's. Demonstrate capacity to model physical phenomena using PDE's (in particular using the Heat equation, Wave equation and Laplace equation). Solve different Initial Boundary Value Problems (IBVP) with homogeneous and non-homogeneous boundary conditions.</p> <p>Apply problem-solving using concepts and techniques from PDE's and Eigen function expansion in the basis of complete orthogonal functions (in particular, expansion of solutions as Fourier series and Fourier-Legendre series) to diverse situations in physics, engineering, financial mathematics and in other mathematical contexts.</p>

COURSE DETAILS

S. No	Module ID/ Lecture ID	Lecture Title/Topic	Duration
1	L1	Motivational Introduction	32:30
2	L2	Formation & Classification Part-I	1:00:43
3	L3	Formation & Classification Part-II	0:57:23
4	L4	1st Order Linear Part - I	0:52:16
5	L5	1st Order Linear Part - II	0:56:27
6	L6	Order Nonlinear Part - I	1:00:10
7	L7	Order Nonlinear Part - II	0:59:30
8	L8	Higher Order Part - I	0:59:19
9	L9	Higher Order Part - II	1:06:58

10	L10	Modeling	0:52:41
11	L11	Fourier Series	1:00:35
12	L12	Canonical - I	0:54:48
13	L13	Canonical - II	0:43:55
14	L14	Wave - I	0:37:12
15	L15	Wave - II	0:56:00
16	L16	Wave - III	0:58:15
17	L17	Heat - I	0:42:27
18	L18	Heat - II	0:53:15
19	L19	Laplace – I	0:54:57
20	L20	Laplace - II	1:00:55
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22			

References if Any: