

**Ambedkar University Delhi**

**Course Outline**

**Winter Semester (January-May 2018)**

<b>School:</b>	Undergraduate Studies			
<b>Programme with title:</b>	BA (Honours) Mathematics			
<b>Semester to which offered:</b>	VI semester			
<b>Course Title:</b>	Partial Differential Equations			
<b>Credits:</b>	4 Credits			
<b>Course Code (new):</b>	SUS1MA542			
<b>Course Code (old):</b>	M17 & M18 (iv)			
<b>Type of Course:</b>	Compulsory	No	Cohort	BA (H) Mathematics
	Elective	yes	Cohort	other than BA (H) Mathematics

**For SUS only** (Mark an X for as many as appropriate):

1. Foundation (Compulsory)
2. Foundation (Elective)
3. Discipline (Compulsory)
4. Discipline (Elective) X
5. Elective X

**Course Coordinator and Team:** Dr Mradul Veer Singh (CC), Dr. Pranay Goswami

**Email of course coordinator:** mradul@aud.ac.in

**Pre-requisites:** MA510 (M13)

**Aim:** Partial Differential Equations is a subject that is widely used by academics (Mathematicians and others) as well as researchers, professionals; not only related to mathematics but also in different areas of science and technology. The course on Partial Differential Equations has been designed to introduce to formulate, classify, interpret and solve first and second order PDE's. The students will be exposed to various applications of these topics in real world related problems such as heat conduction, vibrating string and wave equations. The course has an added attraction of the compulsory lab component where

using Mathematica, one can plot the graphs of the solutions of the partial differential equations. This helps students to visualise the geometry behind the solution of a particular type of partial differential equation.

**Brief description of modules/ Main modules:**

- 1. Introduction to Partial Differential equations**
- 2. Classification of Second-Order Linear Equations**
- 3. The Cauchy Problem and Wave Equations**
- 4. Method of Separation of Variables**
- 5. Lab work using MATHEMATICA**

**References:**

- (1)** Tyn Myint-U and Lokenath Debnath, *Linear Partial Differential Equations for Scientists and Engineers*, 4th edition, Springer, Indian reprint, 2006
- (2)** Martha L Abell, James P Braselton, *Differential equations with MATHEMATICA*, 3<sup>rd</sup> Edition, Elsevier Academic Press, 2004.

**Assessment Details with weights:**

<b>S.No</b>	<b>Assessment</b>	<b>Date/period in which Assessment will take place</b>	<b>Weightage</b>
1	Class test	Second/third week of February, 2017	10%
2	Mid Semester Exam	as per AUD academic calendar	25%
3	Lab Work / assessments	Throughout the semester	20%
4	Presentation/ Viva	First/Second week of April, 2017	10%
5	End Semester Exam	As per AUD Academic Calendar	35%