



# **Course Outlines**

## **Course Details:**

Course Code : MAT 325                      Credit hours: 3.0  
 Course Title : Differential Equations and Fourier Analysis  
 Program : CSE/CSIT  
 Semester : Summer – 2016 (Evening)  
 Course Teacher : Bristee Saha  
   Lecturer, Dept. of CSE/CSIT

## **Course Assessment:**

The assessment components for evaluation of students are as follows:

<b>Item/Activity</b>	<b>Marks (%)</b>
Work Sheet (including class attendance and class tests)	25%
Assignment/ Presentation	10%
Mid-Term Test	25%
Final Examination	40%
<b>Total</b>	<b>100%</b>

## **Course Contents:**

<b>Lectures</b>	<b>Contents (Each lecture will be 1.5 hours duration)</b>
Lecture-1	<b>Ordinary Differential Equations:</b> Degree of ordinary differential equations
Lecture-2	Order of ordinary differential equations
Lecture -3	Formation of differential equations
Lecture -4	Solutions of first order differential equations by various methods
Lecture -5	Solutions of first order differential equations by various methods
	<b>Assignment/Presentation</b>
Lecture -6	Solutions of general linear equations of second and higher orders with constant coefficients
Lecture -7	Solutions of general linear equations of second and higher orders with constant coefficients
	<b>Class Test</b>
Lecture -8	Solution of homogeneous linear equations
Lecture -9	Solution of homogeneous linear equations
Lecture -10	Solution of differential equations of the higher order when the dependent or independent variables are absent

Lecture -11	Solution of differential equation by the method based on the factorization of the operators
Lecture -12	Solution of differential equation by the method based on the factorization of the operators
	<b>Class Test</b>
	<b>Mid-Term</b>
Lecture -13	<b>Partial Differential Equations (PDE):</b> Solution by separation of variables; Linear PDE with constant coefficients
Lecture -14	Solution of Bessel's and Legendre's differential equation
Lecture -15	<b>Series Solution:</b> Solution of differential equations in series by the method of Frobenius
	<b>Assignment/Presentation</b>
Lecture -16	<b>Fourier series and Transform:</b> Real and complex form of Fourier series
Lecture -17	Fourier co-efficient
	<b>Class Test</b>
Lecture -18	Convergence of Fourier series
Lecture -19	Exponential form of Fourier series
Lecture -20	Fourier integral
Lecture -21	Fourier integral
Lecture -22	Fourier transforms and their uses in solving boundary value problems
Lecture -23	Fourier transforms and their uses in solving boundary value problems
Lecture -24	Overview
	<b>Class Test</b>
	<b>Final Examination</b>

<b>Textbooks:</b>	<ol style="list-style-type: none"> <li>1. Differential Equations Sheply L. Ross</li> <li>2. Ordinary and Partial Differential Equations Md. Raisinghanian</li> <li>3. Ordinary Differential Equations B. D. Sharma</li> <li>4. Fourier Analysis Murray R. Spiegel</li> </ol>
-------------------	--