Lesson Plan (Even semester)
(January 2019 to May 2019)
B. Sc. (Hons) Mathematics (Semester II).
Subject: C-4 Differential Equation

Teacher: Mr. Basant Kumar Mishra

References:	1. Belinda Barnes and Glenn R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach Using Maple, Taylor and Francis, London and New York, 2002.
	2.C. H. Edwards and D. E. Penny, Differential Equations and Boundary Value Problems: Computing and Modeling, Pearson Education, India, 2005.
	3. S. L. Ross, Differential Equations, John Wiley and Sons, India, 2004.

Unit	Week	Topics Covered
1	**Week-1** January 1-4, 2019	Differential equations and mathematical models, Order and degree of a differential equation,
	Week-2 January 7-11, 2019	Exact differential equations and integrating factors of first order differential equations.
	Week-3 January 14-18, 2019	Reducible second order differential equations. Application of first order differential equations to acceleration-velocity model, Growth and decay model
2	**Week-4** January 21-25, 2019	Introduction to compartmental models, Lake pollution model (with case study of Lake Burley Griffin).
	Week-5 January 28 - Feb 1, 2019	Drug assimilation into the blood (case of a single cold pill, case of a course of cold pills)
	Week-6 February 4-8, 2019	Case study of alcohol in the bloodstream, Exponential growth of population,
	Week-7 February 11-15, 2019	Density dependent growth. Limited growth with harvesting. General solution of homogeneous equation of second order, Principle of superposition for a homogeneous equation;
3	**Week-8** February 18-22, 2019	Wronskian, its properties and applications;
	Week-9 Feb 25- March 1, 2019	Linear homogeneous and non-homogeneous equations of higher order with constant coefficients;Test and Assignment for Unit 1 & part of Unit 2
	Week-10 March 4-8, 2019	Euler's equation, Method of undetermined coefficients, Method of variation of parameters;
	Week-11 March 11-15, 2019	Test and Assignment for Unit 2 & 3

4	Week-12	Applications of second order differential equations to mechanical vibrations.
	March 25-29, 2019	
	Week-13	Interacting population models,
	April 1-5, 2019	
	Week-14	Epidemic model of influenza and its analysis, Predator-prey model and its analysis, Equilibrium points,
	April 8-12, 2019	
	Week-15	Interpretation of the phase plane, Battle model and its analysis.
	April 15-19, 2019	
	Week-16	Conditional Convergence, Doubt Class, Test(if required) and Assingments sumbission.
	April 22-26, 2019	