Curriculum Plan (EVEN SEM 2021): B.Sc. Mathematics (Semester II)

Differential Equations

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			Marks Distribution	**Theory**	**75 Marks**
				Internal Assessment	**25 Marks**
			Classes Assigned	**Lectures**	**3 per week**

References		**1. Barnes, Belinda & Fulford, Glenn R. (2015). Mathematical Modelling with Case Studies, Using Maple and MATLAB (3rd ed.). CRC Press, Taylor & Francis Group.** **2. Edwards, C. Henry, Penney, David E., & Calvis, David T. (2015). Differential Equation and Boundary Value Problems: Computing and Modeling (5th ed.). Pearson Education.** **3. Ross, Shepley L. (2004). Differential Equations (3rd ed.). John Wiley & Sons. India**	
	Week	**Topics**	
	Beginning/1st week April 1-7, 2021	Introduction of Differential Equations and Mathematical Models	
	2nd week April 8-14, 2021	Introduction to Compartmental models	
	3rd week April 15-21, 2021	Growth and Decay Models, Lake pollution model (with case study of Lake Burley Griffin)	
	4th week April 22-28, 2021	Lake pollution model (with case study of Lake Burley Griffin)	
	5th week April 29- May 5, 2021	Drug assimilation into the blood (case of a single cold pill, case of a course of cold pills, case study of alcohol in the bloodstream)	
	6th week May 6-12, 2021	Exponential growth of population, Limited growth of population, Limited growth with harvesting	
	7th week May 13-19,2021	General solution of homogeneous equation of second order, Principle of superposition for a homogeneous equation	

	8th week May 20-26,2021	Wronskian, its properties and applications	
	9th week May 27-2 June, 2021	Linear homogeneous and non-homogeneous equations of higher order with constant coefficients	
	10th week June 3-9, 2021	Euler's equation, Method of undetermined coefficients	
	11th week June 10-16, 2021	**Assignment submission and class test scheduled**	
	12th week June 17-23, 2021	Method of variation of parameters, Applications of second order differential equations to mechanical vibrations	
	13th week June 24-30, 2021	Interacting population models, Epidemic model of influenza. and its analysis	
	14th week July 1-7, 2021	Predator-prey model and its analysis, Equilibrium points, Interpretation of the phase plane	
	15th week July 8-14, 2021	Predator-prey model and its analysis, Equilibrium points, Interpretation of the phase plane	
	16th week July 15-20, 2021	Battle model and its analysis	
Dispersal of classes, preparation leave and practical examination begin July 21, 2021.			