

Programme: Degree Class: B.Sc.		Year: III	Semester: VI	
Subject: Mathematics				
Course Code:		Course Title: Mathematical Modelling		
Course Outcome	CO1: Understanding fundamental mathematical concepts and skills to deal with real world problems. CO2: Understanding a mathematical model and the steps involved in Mathematical Modeling Process. CO3: Understanding the techniques to develop various mathematical models through geometry, algebra and ordinary differential equations of first order.			
Unit No.	Course Content			Hours
I	Mathematical Modelling: Definition, Need, Classification, Simple Situations Requiring Mathematical Modelling, The Technique of Mathematical Modelling, Classification of Mathematical Models, Some Characteristics of Mathematical Models.			8
II	Mathematical Modelling through Geometry, Mathematical Modelling through Algebra, Mathematical Modelling through Trigonometry, Mathematical Modelling through Calculus, Limitations of Mathematical Modelling.			8
III	Linear growth and decay models: Population growth model, Effect of immigration and Emigration on population size, Decrease of temperature, diffusion, Change of price of a commodity, Non-linear growth and decay model: Simple logistic model, Logistic model for non- isolated population, Simple compartment models.			8
IV	Mathematical modeling of Epidemics: Basic concept, Simple Epidemic model through system of ordinary differential equation of first order- A simple epidemic model, SIS model with constant number of carrier, Simple epidemic model with carriers, Model with removal, Model with removal and immigration.			8
V	Economics based models: Domar Macro model, Domar first debt model, Momar's second debt model, Samuelson's investment model.			8
Suggested Readings:				
1. J. N. Kapur: Mathematical Modelling (New Age International Private Limited)				
2. B. Barnes, G.R. Fulford: Mathematical Modelling -with Case Studies: Using Maple and MATLAB (CRC Press)				
3. Suggested digital platform: NPTEL/SWAYAM/MOOCs				

Mapping of course outcomes with program outcomes & program specific outcomes

CO's No.	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	1	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3