

Course Title	Mathematical Modeling			Course Code	MT 21012		
				Prerequisites	-		
Year	2	Semester	1	Credits	2	Theory (hr)	30
						Practical (hr)	
						Independent Learning (hr)	

Aim:

To educate in the theoretical and practical aspects of mathematical problem solving and mathematical model development.

Intended Learning Outcomes:

On the successful completion of the course, students should be able to:

1. Explain how the general principles arise in the context of Mathematical Modeling.
2. Analyze some existing mathematical models and construct meaningful models of simple mechanical, financial, physical and biological system.
3. Formulate, solve and interpret real world problems.

Course content:

- Modeling methodology: Introduction, Definitions and terminology
- Modeling skills: Listing factors, making assumptions, formulating models.
- Modeling using difference equations for mechanical, financial, physical and biological system.
- Modeling using differential equations for mechanical, financial, physical and biological system.
- Case studies and presentation of models.

Assessment Strategy:*

*Changed due to epidemic situations

- Continuous Assessment – 40%
Assessment-1 (ILO-1, ILO-2) -Open book exam (10%)
Assessment-2 (ILO-2) – Open book exam (10%)
Assessment-3 (ILO-3) - Open book exam (10%)
Assessment-4 (ILO-2, ILO-3) - Open book exam (10%)
- End Semester Examination ILO 1 - 3) –60%
Closed book exam - 2 Hours

References:

1. Frank R. Giordano, William P. Fox, Steven B. Horton and Maurice D. Weir, *A First Course in Mathematical Modeling*, Brooks/Cole, Cengage Learning, 2009;
2. Dilwyn Edwards and Mike Hamson, *Guide 2 Mathematical Modelling*, Palgrave, 2007.