AMITY UNIVERSITY
UTTAR PRADESH

Annexure **'AAB-CD-01'**

Course Title: Basics of System Simulation & Modeling
Course Code: to be decided later
Credit Units: 2
Level: UG

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
2	0	0	0	2

Course Objectives:

The objective of the course is to acquaint students with the basics methods of simulation using Simulink , MATLAB and object oriented language .

Prerequisites:
Automatic Flight Control, Stability and control

Course Contents / Syllabus:

Course Contents / Syllabus:	Weightage %
Module I Introduction	**20% Weightage**
• Aerospace Systems, subsystems etc, Computational requirements – Speed, accuracy, System Programming Tools – Mat lab /Embedded C/C++, Simulation Tools : SIMULINK.	

Module II Simulink for Simulation	**30% Weightage**
• Octave/Simulink: Mat Lab Programming review, code and software design, function & API, Examples : 6 DOF A/C dynamics, Spacecraft dynamics, FID control, MPC control, Automatic flight Control Simulations.	
Module III Object Oriented Simulation	**30% Weightage**
• Simulation using object oriented language, C/C++ concept, language constructs, safely critical software functions and its use. Exception handling , simulation techniques	
Module IV Case Studies	**20% Weightage**
• Based on particle Swarm Techniques, Bee Colony techniques. • CASE STUDY; Optimal PN guidance, optimal heading control.	

Student Learning Outcomes:

- On completion of the course the student will be able to:
- Design a simulation of a given system
- Understand various parameters involved in simulation
- Analyse simulation results and incorporation of same in design there of

Pedagogy for Course Delivery:

The course pedagogy will include lectures , numerical examples , MAT Lab codes and C / C++ simulation examples.and lecture notes.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	End Term Examination
100%	NA	100%

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					**End Term Examination**
Components (Drop down)	Mid-Term Exam	Home Assignment	Viva	Attendance	
Weightage (%)	10%	7%	8%	5%	70%

Texts & Reference :

1 *Simulation of Dynamic System (with Mat Lab & Simulink* *Harold Lee, Raudal Allan, CRC Press 2011*
2 *System Simulation Techniques with Mat Lab & Simulink* *Degngyu Xne, Yaugquan Chen: Wiley International*
3 *Aircraft Dynamics: From modelling to Simulation* *Napolitano John Wiley and Sons 2013*

Remarks and Suggestions:

Date:

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Name, Designation, Organisation