

# GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 1

**Mechanical Engineering (I.C.Engine & Automobile)**

Subject Name Modeling, Simulation & Computer Application

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| Sr.No | Course content  |
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| 1.    | Concept of system and environment; Continuous and discrete system; linear and nonlinear systems; stochastic activities; static and dynamic models; principles used in modeling; Models classifications, Mathematical models, Physical models, analog models and others, Estimation of model parameters; |
| 2.    | Technique of simulation; experimental nature of simulation; numerical computation techniques; continuous system models; analog and hybrid simulation; feedback systems; Stochastic variables; discrete and continuous probability functions; random numbers; rejection method.                          |
| 3.    | Computer technique for simulation; computer generation of Pseudo random; Application, Modeling of Civil, Electrical and Mechanical components of small hydro and Renewable Energy Projects.   |
| 4.    | Introduction to MATLAB, Various Simulation tools.   |

## Reference Books:

1. System Simulation, Geoffrey Gordon Prentice-Hall
2. System Simulation, The Art and Science, Robert E. Shannon Prentice – Hall
3. System Modeling and Control, J. Schwarzenbach and K. F. Gill, Edward Arnold
4. Modeling and Analysis Of Dynamic Systems, Charles M. Close & Dean K. Frederick  
Houghton Mifflin
5. Simulation of Manufacturing, Allan Carrie John, Wiley & Sons
6. Computational Heat Transfer, Y. Jaluria and K. E. Torrance Hemisphere Publishing
7. System Simulation Dr. D. S. Hira