TIF21-22-47

Modelling and Simulation

Teknik Pemodelan dan Simulasi

BASIC INFORMATION

Course Credit	2 / 100 minutes per Week
Course Type	Required
Course Classification	Engineering Topics
Prerequisites	-

STUDENT AND LEARNING OUTCOMES

Covered Student Outcomes

Fundamental and Engineering Knowledge (a)   Modern Tools Utilization (e)

Development of Engineering Solution (b)

Learning Outcomes

LO1 Student able to understand applying process modeling and dynamic system modeling.

LO2 Student able to understand and explain the models commonly used in literature such as data-driven models and agent-based models.

LO3 Student able to design and apply Monte-Carlo simulation for simple problems.

LO4 Student understand the latest simulation techniques.

COURSE DESCRIPTION

This course deals with model modeling and dynamic system modeling. It includes "Data-Driven", "Model-Driven"; and "Agent-Based Modeling." In addition, advanced simulation techniques will also be of concern in this course.

TOPICS

1. Introduction:
2. Problem Solving Methodology
3. Modeling Process
4. Computational errors
5. Calculus
6. Growth
7. Accelerated motion
8. Machine Learning Modeling
9. Simulation Technique

REFERENCES

[1] Angela B. Shiflet and George W. Shiflet, *Introduction to Computational Science: Modeling and Simulation for the Sciences (Second Edition)*, Princeton University Press, 2014.

[2] V.P. Singh, *System Modeling and Simulation*, New Delhi: New Age International Publishers, 2009.

[3] Ed Sickafus, PhD, *A Simple Theory Underlying Structured, Problem-Solving Methodologies* – ASIT, TRIZ, USIT, 2014.