

Title: Discrete Event Simulation to Model Industrial Systems

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Indicative period: September 2022-February 2023

ABSTRACT:

Computer modeling and simulation (M&S) allows engineers to study and analyze complex systems. Discrete-event system (DES)-M&S is used in modern management, industrial engineering, computer science, and the military. As computer speeds and memory capacity increase, so DES-M&S tools become more powerful and more widely used in solving real-life problems.

The course aims at the introduction of Basics of Discrete-Event System Modeling and Simulation, and at giving an overview of all the major DES modeling formalisms. The Event-Based and Activity Based Modeling and Simulation views will be used to exemplify the application of DES to model industrial systems. Latest advances in DES will be addressed by introducing the Object-Oriented Event Graph formalism, which is particularly important for the Industry 4.0 paradigm, in which optimization via simulation, real-time simulation, automatic decisions systems based on simulation, on line scenario analysis play a relevant role.

PROGRAM:

Overview of Computer Simulation

Basics of Discrete-Event System Modeling and Simulation

Framework of Discrete-Event System Modeling

Introduction to Event-Based Modeling and Simulation

Execution of Event Graph Models with SIGMA

Parameterized Event Graph Modeling and Simulation

Execution of Parameterized Event Graph Models Using SIGMA

Introduction to Activity-based Modeling & Simulation

Simulation of ACD Models Using Arena.

Advances in discrete-event system modeling and simulation.

The Object oriented Event Graph Formalism.

Applications: Modeling and simulation of tandem production lines; The Assembly Line Simulator Project