

**Title:** Discrete Event Simulation to Model Industrial Systems

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### **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 Modeling and Simulation view 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