BENEFITS OF THE PROGRAM

- Deepened knowledge and training in the field of modeling and simulation;
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APPLICATION REQUIREMENTS

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UCF M&S Graduate Program Director
Graduate Research Professor for the Institute for Simulation & Training

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This program is supported by:
ABOUT THE PROGRAM
The Graduate Certificate in Modeling & Simulation of Technical Systems offered by the Modeling & Simulation Graduate Program at the University of Central Florida (UCF) is a 16-credit-hour certificate program that provides students with specialized training and knowledge in modeling and simulation (M&S) fundamentals and techniques and applications, with special emphasis on M&S in test and evaluation. More specifically, this Certificate is designed to prepare students from a variety of disciplinary backgrounds in the interdisciplinary field of M&S as it provides a unique opportunity to explore the interface and interdependence of M&S and test and evaluation and to apply this learning.

UCF offers one of the most respected graduate degree programs in modeling and simulation in the country and has long been a leader in preparing engineers, scientists and managers to design, develop, implement and manage integrated modeling, simulation and training systems. This Certificate program, which offers M&S professionals the opportunity to acquire critical knowledge and training without committing to a full Master’s degree program, is designed for part-time enrollment in order to accommodate students and professionals working full-time. This Certificate also meets the needs of those who work in the field of modeling, simulation and training without academic degrees in M&S.

PROGRAM CURRICULUM
The program is a total of 16 graduate credit hours in the competency areas of Modeling and Simulation Fundamentals, Testing and Evaluation, and Modeling Techniques and Applications.

Students may either proceed through the certificate program by enrolling in one course each semester, or multiple courses each semester. The courses are all delivered electronically via distance education.

PROGRAM CURRICULUM (CONT.)
Upon completion of the Certificate program, interested students may apply for admission to the UCF M.S. in Modeling & Simulation degree program. If accepted, completed credits earned toward the M&S of Technical Systems Graduate Certificate will be applied to the degree program, as applicable.

COURSE DESCRIPTIONS
(Listed in order of course progression)

Perspectives on Modeling and Simulation (Fall)
The goal of this introductory course is to communicate foundation and philosophy regarding simulation science, methodology and technology. Topics include the history of simulation, M&S in the military, and other application areas of M&S (e.g., simulation for entertainment, disaster response, and simulation in healthcare delivery).

Discrete Systems Simulation (Spring)
This course focuses on and balances the two primary aspects of discrete systems simulation. The first aspect of this course covers topics including the underlying probabilistic and statistical aspects of computer simulation, modeling and estimating input processes, statistical analysis of simulation output and designing simulation experiments. The second aspect of this course involves real-world system and process abstraction and hands-on simulation modeling using a commercial simulation modeling software.

Modeling and Simulation Systems (Summer)
In general, simulation analysts design, develop, install, verify and validate integrated modeling and simulation systems. This course, through a top-down approach, introduces students to managing and developing such simulation systems. The course goals are to: identify the various problems areas suitable for modeling and simulation solutions; describe the types of models and meet the challenges of designing and developing appropriate models for the system; describe the types of simulations and meet the challenges of designing, developing and evaluating the output of simulation systems; and gain skills with system analysis, modeling and simulation techniques and tools.

Modeling and Simulation Capstone Report Planning (Summer)
Students will develop the topic and required resources of their future capstone projects and complete a short literature review as well as a topical outline of the capstone report.

Modeling and Simulation for Testing and Evaluation (Fall)
Use of simulation in support of test planning, test execution, and systems analysis is described, characterized, and illustrated with real-world examples. Issues and opportunities relevant to the integrated use of simulation and testing are identified; and strategies to optimize the use of scarce resources in executing test and evaluation programs are provided. Other topics covered include: an overview of Verification, Validation & Accreditation; development and use of distributed simulation in a military context; and a brief review of pertinent statistical concepts and practices.

Simulation Research Methods and Practicum (Spring)
This course serves as the capstone course of the lock-step certificate program. It includes elements of an internship in which students complete a real-world project, which is typically related to their employment or is an extension of the students’ work or interests.
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