SYSTEMS ENGINEERING

Systems Engineering Program Learning Outcomes (https://catalog.csudh.edu/program-learning-outcomes/natural-behavioral-sciences/master-science-systems-engineering/)

College of Natural and Behavioral Sciences
Department of Physics
Master of Science - Systems Engineering

Faculty

Jim Hill, Department Chair
Antonia Boadi, Ximena Cid, Horace Crogman, , John W. Price
To Dang, Technician

Emeritus Faculty

H. Keith Lee, Samuel L. Wiley

Program Description

The Master of Science in Systems Engineering MSSE) program is designed to provide professional preparation for private, public, and non-profit sector professionals in the field of Systems Engineering. The curriculum, delivered in an accelerated 21-month cohort model, requires completion of 34 units. The program culminates with a Systems Engineering research project supervised by a faculty member.

Features

The MSSE program was established in response to regional and national workforce needs. Systems engineers possess analytical skills required to support a broad range of job functions: from the development of systems that facilitate split second trading on Wall Street to the integration of satellite surveillance systems that support the collection, analysis and fusion of heterogeneous multimedia sources.

The MSSE program is a Practitioner's program. Assignments are based on case studies and conventional exams are not administered in most courses. Instead, students propose solutions to Engineering Design Challenges (EDCs). An Engineering Design Challenge requires a student to apply theoretical concepts to a problem characterized by specific technical, fiscal and operational constraints. Depending upon the complexity of the EDC, students will be allowed 3-10 days to develop a solution. The product of each EDC becomes part of the student's graduate project portfolio.

Students in many degree programs may not begin to develop their projects/theses until the end of their curriculum. The MSSE curriculum employs a model that allows students develop their projects incrementally. Each semester students enroll in a 1-unit course entitled Systems Engineering Project Phase (I, II, III, and IV). The product of each of these courses corresponds to a chapter in the final project report. This approach facilitates the organic development of the project because each project component builds upon work completed during the previous term.

Academic Advising

Students will be advised once each semester, prior to registration. Students develop their capstone projects incrementally, beginning in their first term. Student research progress will be reviewed during each academic advising session.

Career Possibilities

Systems Engineering has been implemented in nearly every field, including:

- Aerospace
- Automotive Design and Manufacturing
- Biotechnology
- Counter-Terrorism
- Critical Infrastructure
- Cyber Security
- Defense
- Environmental/Green Engineering
- Healthcare
- Homeland Security
- Manufacturing
- Next Generation Farming
- Oil and Gas
- Power and Energy Systems
- Quality Assurance
- Safety/Security Engineering
- Social Network Systems Architecture
- Space Systems
- Telecommunications
- Transportation

Departments, Professional Organizations, and Co-curricular Activities

The CSUDH Science Society, Society of Physics Students and Sigma Pi Sigma (National Physics Honor Society) cooperate in offering lectures, social programs and field trips to promote student participation in and enjoyment of the sciences. These activities are enriching and greatly enhance our students' growth within our community of scholars. In addition, faculty are often willing to sponsor inexpensive student memberships in national physics organizations which publish ongoing research in a variety of areas of physics and engineering. The department sponsors a colloquium series with talks a few times each semester on various topics in physics and engineering.

Master of Science in Systems Engineering

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Degree Requirements

Core Curriculum (34 units)

SEE 501 Systems Engineering Project Phase I (1)
SEE 502 Systems Engineering Project Phase II (1)
SEE 503 Systems Engineering Project Phase III (1)
SEE 504 Systems Engineering Project Phase IV (1)
SEE 510 Introduction to Systems Engineering (3)
SEE 520 Analytics in Systems Engineering (3)
SEE 530 Quantitative Methods in Systems Engineering (3)
SEE 540 Economic Factors in Systems Engineering (3)
SEE 550 Modeling and Simulation (3)
SEE 560 Model Based Systems Engineering (3)
SEE 570 Complex Systems Architecture (3)
SEE 580 System-of-Systems Engineering (3)
SEE 585 Engineering Complex Systems (3)
SEE 590 Master's Project (3)