PROGRAM DESCRIPTION

Systems Engineering is an interdisciplinary approach to managing complex systems and projects. Because systems engineering is central to many businesses and organizations, the demand for graduates is very high. Through this program, students take six core courses in theory and application of systems engineering and management. In addition, four courses can be taken in an area of specialization, allowing the student to design a program that best fits his/her career interest and goals.

Areas of specialization include computational intelligence, distributed systems modeling, computer engineering, aerospace engineering, modeling and simulation, network centric systems, quality and reliability risk modeling and assessment, statistics, structures, infrastructure systems, systems architecting and systems design optimization.

Credit Hours to Complete: This degree requires 36 credit hours for thesis and 30 credit hours for non-thesis of coursework to complete.

Course Length: 16 weeks (fall/spring); 8 weeks (summer)

Delivery Format: Courses are delivered over the Internet, via live streaming video; collaborative learning software includes WebEx and Blackboard; classes are archived online for review and easy access.

Course Management Software: Blackboard.

PhD in Systems Engineering: is individually structured by the student in consultation with and approval by the student’s advisory committee. A dissertation is required. Total credit requirements for graduation are a minimum of 60 credit hours after successful completion of MS degree in Systems Engineering, or a minimum of 90 credit hours after a BS.

ADMISSIONS REQUIREMENTS

• Bachelor’s degree in an engineering discipline applied mathematics, computer science or a physical science.
• Cumulative GPA ≥ 3.0.
• GRE V+Q ≥ 303, A ≥ 4.5.
• International students: In addition to bachelor’s GPA and GRE requirements, TOEFL ≥ 580 PBT/237 CBT/92 iBT.

PhD Requirements
• MS in Systems Engineering or related field with a 3.5 GPA.
• Minimum of three years of work experience.

CONTACT INFORMATION

Engineering Management & Systems Engineering
223 Engineering Management, 600 W. 14th St.
Rolla, MO 65409-0370
Phone: 573-341-7211 | 573-341-4990
Email: syseng@mst.edu | Web: emse.mst.edu

Vicki Gibbons
Global Learning Student Services
Phone: 573-341-6591 | Toll Free: 1-877-678-1870
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Email: global@mst.edu

Application Deadlines: Although there are no set deadlines, apply early to ensure class selections.
Fall Semester - August | Spring Semester - December | Summer Session - May

distance.mst.edu | global@mst.edu
**SYSTEMS ENGINEERING**

The Graduate Certificate in Systems Engineering provides structured training in the fundamentals of systems engineering to equip engineers with the skills that can be used in the design, operation, and maintenance of systems throughout their life cycle. The techniques covered and concepts introduced are applicable to any industry.

Curriculum*

The following courses are required:

- SYS ENG 5101 Systems Engineering and Analysis I
- SYS ENG 6103 Economic Analysis of Systems Engineering Projects
- SYS ENG 6102 Systems Engineering Analysis II
- SYS ENG 6104 Systems Architecting

**COMPUTATIONAL INTELLIGENCE**

*(shared with Computer Engineering and Computer Science)*

This graduate certificate program provides practicing engineers the opportunity to develop the necessary skills in the use and development of computational intelligence algorithms based on evolutionary computation, neural networks, fuzzy logic, and complex systems theory. Engineers can also learn how to integrate common sense reasoning with computational intelligence elective courses such as data mining and knowledge discovery.

Curriculum*

The following course is required:

- COMP ENG 5310/ ELEC ENG 5310/ SYS ENG 5211 Computational Intelligence

One course from the following is required:

- COMP SCI 5400 Introduction to Artificial Intelligence
- COMP SCI 5401 Evolutionary Computing
- SYS ENG 5212/ELEC ENG 5370 Introduction to Neural Networks & Applications

**MODEL BASED SYSTEMS ENGINEERING**

This graduate certificate program provides practicing engineers the opportunity to develop the necessary skills in the use of current modeling techniques to develop and simulate complex, multi-disciplinary engineering systems. In addition, engineers will learn methods to automate data acquisition for system development, establish rules for reusability of model resources, and acquire necessary skills for simulating the designed systems.

Curriculum*

The following courses are required:

- SYS ENG 6541 Distributed Systems Modeling
- SYS ENG 6542 Model Based Systems Engineering
- SYS ENG 6239 Smart Engineering System Design
- ENG MGT 5411 Engineering Design Optimization

**NETWORK CENTRIC SYSTEMS**

*(Shared with Electrical and Computer Engineering)*

The graduate certificate in Network Centric Systems allows practicing engineers to develop the necessary skills for the design and operation of network centric systems. The graduate courses selected for the program address the intersection between network engineering and systems engineering and architecting.

Curriculum*

The following two courses are required:

- SYS ENG 6321/COMP ENG 6410 Network Centric Systems Architecting & Engineering
- COMP ENG/SYS ENG 6322 Network Centric Systems Reliability & Security

Select two courses from the following:

**Network Engineering:**

- COMP ENG 5410 Digital Network Design
- COMP ENG 5430 Wireless Networks
- COMP ENG 5420 Trustworthy, Survivable Computer Networks

**Smart Engineering Systems Architecting:**

- SYS ENG 6541 Distributed Systems Modeling
- SYS ENG 6213 Advanced Neural Networks
- SYS ENG 6239 Smart Engineering System Design

*Each of these certificates consists of four courses. Students will be responsible for prerequisite knowledge as determined by course instructors and listed in the Graduate Catalog. Other courses approved by the department may be substituted for any of the above listed courses on a case-by-case basis. The administrative coordinators must approve the substitution prior to enrolling in the course.*
ADMISSIONS REQUIREMENTS

- Persons holding a BS, MS or PhD degree (with at least one degree in engineering, applied mathematics, computer science or a physical science).
- GRE score is NOT required.
- Minimum of two years of professional employment experience or are currently accepted into a graduate degree program at Missouri S&T.
- Once admitted you have three years to complete the program.
- A grade B or better must be made to receive a graduate certificate.

GRADUATE CERTIFICATES — PATHWAY TO MASTER’S DEGREE PROGRAM

If you successfully complete a certificate program, with a B grade or better in each course, you are eligible to apply to the master’s degree program in systems engineering at Missouri S&T, without taking the GRE, or meeting the undergraduate GPA requirements.

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