Computer Engineering (MS)
Distance Graduate Degree Program
Department of Electrical and Computer Engineering

Program Description
Computer engineers serve a vital role in driving and implementing new technologies. From technical proficiency in software and hardware to the understanding of complex systems, economic impact and ethics, students in the computer engineering program become competent problem solvers at all levels of computer engineering. This program provides students with the unique opportunity to learn about the relationships among different engineering disciplines.


Credit Hours to Complete: This degree (offered as both thesis and non-thesis options) requires 30 credit hours of coursework to complete.

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.

Admission Requirements
Bachelor's degree in related field from ABET accredited university (or equivalent international), with GPA ≥ 3.2; GRE V+Q ≥ 301; GRE Q ≥ 157 (1100, GRE Q ≥ 730 on the old scale); GRE WR score ≥ 3. International requirements: three letters of recommendation, TOEFL>92 iBT (580 on paper scale).

Department Contact Information
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Computational Intelligence  
(shared with Systems 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 358/ELEC ENG 367/SYS ENG 367  
Computational Intelligence

Select one course from the following:  
COMP SCI 347 Introduction to Artificial Intelligence  
COMP SCI 348 Evolutionary Computing  
SYS ENG 378/ELEC ENG 368 Introduction to Neural Networks and Applications

Elective Courses (Select two courses not taken as a core course):  
ELEC ENG/COMP ENG/SYS ENG 301 Evolvable Hardware  
COMP SCI 347 Introduction to Artificial Intelligence  
COMP SCI 348 Evolutionary Computing  
COMP SCI 447 Advanced Topics in Artificial Intelligence  
COMP SCI 448 Advanced Evolutionary Computing  
SYS ENG/COMP ENG/ELEC ENG 458 Adaptive Critic Designs  
COMP SCI 434/SYS ENG 404/COMP ENG/404  
Data Mining and Knowledge Discovery  
ELEC ENG 337 Neural Networks for Control  
SYS ENG 378/ELEC ENG 368 Introduction to Neural Networks and Applications  
MECH ENG 447/COMP ENG/ENG MGT/AERO ENG  
COMP SCI 457 Markov Decision Processes  
SYS ENG 478 Advanced Neural Networks

Electric Machines and Drives
This graduate certificate program is designed to provide specialized graduate-level education for working professionals in the area of Electric Machines and Drives.

Curriculum:*  
The following two electric power systems courses must be taken:  
ELEC ENG 305 Electric Drive Systems  
ELEC ENG 402 Advanced Theory of Electric Machines

A minimum of two of the following electric power systems courses must be taken:  
ELEC ENG 304 Power Quality  
ELEC ENG 331 Digital Control  
ELEC ENG 353 Power Electronics  
ELEC ENG 371 Grounding and Shielding  
ELEC ENG 401 Electric and Hybrid Vehicles  
ELEC ENG 406 Power System Stability  
ELEC ENG 431 Linear Control Systems

Electric Power Systems Engineering
This graduate certificate program is designed to provide specialized graduate-level education for working professionals in the area of Electric Power Systems Engineering.

Curriculum:*  
The following two electric power systems courses must be taken:  
ELEC ENG 304 Electric Power Quality  
ELEC ENG 307 Power Systems Engineering

A minimum of two of the following electric power systems courses must be taken:  
ELEC ENG 302 Extra High Voltage Engineering  
ELEC ENG 304 Electric Power Quality  
ELEC ENG 352 Photovoltaic Power Systems  
ELEC ENG 404 Economic Operation of Power Systems  
ELEC ENG 405 Power System Protection  
ELEC ENG 406 Power System Stability  
ELEC ENG 407 Surge Phenomena in Power Systems  
ELEC ENG 408 Computer Methods in Power System Analysis  
ELEC ENG 431 Linear Control Systems
**Information Assurance & Security Officer Essentials**  
*Shared with Computer Science*

Missouri S&T is certified by the National Security Agency (NSA) Committee on National Security Systems (CNSS) for National Standards 4011 (National Training Standard for Information Systems Security (INFOSEC) Professionals) and 4014E (Information Assurance Training Standard for Information Systems Security Officers (ISSO)). This graduate certificate program satisfies the 4011 and 4014 standards.

**Curriculum:**

Complete four three-credit courses from the following list:
- COMP SCI 317 Intellectual Property For Computer Scientists
- COMP SCI 362 Security Operations & Program Management
- COMP ENG 349 Trustworthy, Survivable Computer Networks
- COMP ENG 449/SYS ENG 449 Network-Centric Systems Reliability and Security
- COMP SCI 468 Advanced Network Security

**Network Centric Systems**  
*Shared with Engineering Management and Systems 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:**

Core Courses (must take both):
- SYS ENG/CMP ENG 419 Network Centric Systems Architecting and Engineering
- CMP ENG/SYS ENG 449 Network Centric Systems Reliability and Security

Elective Courses (Select two courses from the following)

**Network Engineering**
- COMP ENG 319 Digital Network Design
- COMP ENG 348 Wireless Networks
- COMP ENG 349 Trustworthy, Survivable Computer Networks

**Admission Requirements**

The graduate certificate program is open to all individuals holding a BS in an engineering or hard scientific discipline who have a minimum of two years professional experience or are currently accepted into a graduate degree program at Missouri S&T.

The certificate program consists of four courses, which consist of core and elective courses. In order to receive a Graduate Certificate, the student must have an average graduate cumulative grade point of 3.0 or better in the certificate courses taken.

Student admitted to the certificate program will have non-degree graduate status but will earn graduate credit for the courses they complete. If the four-course sequence approved by the graduate advisor is completed with a grade of B or better in each of the courses taken, the student will be admitted to the MS program in Systems Engineering or Computer Engineering, if they apply. The certificate courses taken by students admitted to the program will count towards their master's degrees.

Once admitted to the program, a student will be given three years to complete the program as long as a B average is maintained in the courses taken.

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