Starting Fall 2012

MS Degree
Applied Engineering & Technology Management (AETM)

Option in
Network Security Management (NSM) Major

I. GENERAL INFORMATION
The Master of Science Degree in Applied Engineering and Technology Management has been planned for those individuals who are interested in careers in industrial, technical, or construction or network security management. Courses in the program have been designed to cause students to examine principles, concepts, attitudes, and methods for dealing with many of the challenges that confront business and industry. The program will be of value to those who are currently employed in business or industry and have professional growth aspirations. It will also be of value to those who have recently completed undergraduate study and want more preparation before embarking upon their career. Upon completion of a degree in Applied Engineering and Technology Management graduates will be able to: 1) plan, implement, and analyze technical projects; 2) demonstrate an ability to formulate and apply advanced technical problem solving and managerial concepts; and 3) accurately synthesize their total program experience.

II. ADMISSION REQUIREMENTS
Applicants are expected to present proper prerequisite preparation or technical management experience. For the Construction Management and the Applied Engineering and Technology Management options, applicants should have an understanding of materials and processes, the principles of production control, and the economics of industry; computer literacy; the ability to communicate graphically; and the ability to apply statistics to the solution of industrial problems. For the Network Security Management (NSM) option applicants should have an understanding of wired and wireless computer network communications, prior educational or work experience related to managing computer network software and hardware; effective communication skills; and the ability to identify, analyze and solve computer network related problems. Applicants must complete either the Graduate Record Examination (GRE) General Test, or the Graduate Management Admissions Test, regardless of undergraduate grade point average. As part of the admission decision, a GAP score is calculated. When the GRE has been taken, the GAP score is obtained by summing the GRE verbal and quantitative scores and then multiplying that sum by the undergraduate grade point average as listed on the candidate’s transcript. The minimum expected GAP score for the program based on the GRE is 2200. When the GMAT has been taken, the GAP score is obtained by multiplying the GMAT score by the undergraduate grade point average as listed on the candidate’s transcript. The minimum expected GAP score for the program based on the GMAT is 1155.

EKU Graduate Catalog 2011-12
Refer to page 62-63 of the catalog for the existing MS degree requirements in Applied Engineering & Technology Management.

Undergraduate/Graduate Concurrent Enrollment Approval Form
Undergraduate students within 30 credit hours of completion of a Bachelor’s degree, with a minimum 3.0 GPA, taking no more than 15 hours undergrad/grad courses combined in semester, can enroll in graduate courses after approval by the graduate program advisor (Dr. Dennis Field), the college dean, and dean of the EKU grad school.
http://gradschool.eku.edu/sites/gradschool.eku.edu/files/files/student_forms/concurrent_enrollment_form.pdf
the applicant related to managerial and technical promise and other life experiences may be considered by
the department Graduate Studies Committee. **International Students** — Applications from international
students are encouraged. Refer to the University admission guidelines for admitting international students. Students must also meet the general requirements of the Graduate School.

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**III. PROGRAM REQUIREMENTS**

Individual plans of study will include work from four areas:

**Major Core Courses** .................................................................18 hours
  - **Applied Engineering and Technology Management Option Core Courses** ..................18 hours
    AEM 706, 801, 802, 804, and 805, TEC 830.
  - **Construction Management Option Core Courses** ........................................... 18 hours
    AEM 801, 804, CON 827, 828, and 829, TEC 830.
  - **Network Security Management (NSM) Option Core Courses** .........................18 hours
    AEM 804, NSM 815, 845, 865, and 895, TEC 830.

**Supporting Courses** .................................................................6 hours
  - **Applied Engineering and Technology Management option supporting courses:**
    Select from ACC 820, CIS 826, GBU 850, MGT 821, MKT 825, QMB 850, STA 700, and other
courses by advisement.
  - **Construction Management option supporting courses:**
    Select from ACC 820, CIS 826, GBU 850, MGT 821, MKT 825, QMB 850, STA 700, and other
courses by advisement.
  - **Network Security Management option supporting courses:**
    Select from AEM 730, 820, CIS 826, 850, 860, CSC 720, 730, 738, 744, 747, 748, 815, 825, 834, 860,
    EAD 824, EDC 810, GBU 850, HLS 830, MGT 821, 850, MKT 825, QMB 850, SED 712, SSE 827,
    STA 700, 701, TEC 867, and other courses by advisement.

**Synthesis Experience** .................................................................6 hours
  (AEM 820 and 821), or (AEM 822 and/or 839).

**Exit Requirement**
  GRD 867c or 868b

**Total** ..................................................................................30 hours

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http://tinyurl.com/7m5r84f
Core and Supporting Course Descriptions

CORE COURSES

AEM 804 Project Management. (3) A.
Formerly INT 804. Prerequisite: Departmental approval. Elements of managing projects including the use of modern project management software. Credit will not be awarded for both AEM and INT 804.

NSM 815 Foundations of Network Security (3) A.: Advanced network security auditing, defense techniques and countermeasures. Network security issues related to hardware and software, for small-to-medium business (SMB) and enterprise-level networks. 2 Lec/2 Lab.

NSM 845 Advanced Server Security (3) A.: Pre-requisites: NSM 815 or Departmental Approval. Security management, planning, designing, performance tuning and troubleshooting servers for small-to-medium businesses (SMBs) and enterprises. Hardening services such as web, DNS, file, Directory, and Terminal access. 2 Lec/2 Lab.

NSM 865 Wireless & Mobile Security (3) A. Pre-requisites: NSM 815 or Departmental Approval. Advance wireless and mobile computing security consideration in small-to-medium business (SMB) and enterprise level networks: Security auditing, standards, protocols, vulnerabilities, attacks, countermeasures, network planning, management and troubleshooting. 2 Lec/2 Lab.

NSM 895 Special Topics in NSM (3) A.: Pre-requisites: NSM 815 or Departmental Approval. Emerging technologies in the area of advanced computer networking or telecommunications security, including LAN/WAN/SAN system administration, hardware, software, virtualization, operating systems, scripting, and related industry certifications. 2 Lec/2 Lab.

TEC 830 Creative Problem Solving. (3) A. A review and analysis of basic and applied research in the development of creative behavior with emphasis on its application to teaching/training and industrial problem solving. Students will be expected to complete a term project showing their creative abilities.

AEM 820 Industrial Technology Proposal. (3) A.
Formerly INT 820. Prerequisite: departmental approval. An individually developed proposal related to a project typically encountered by a manager in a technical environment. The project proposal is to be approved by the student’s graduate advisor. Credit will not be awarded for both AEM and INT 820.

AEM 821 Industrial Technology Project. (3) A. Formerly INT 821. Prerequisite: AEM 820 or departmental approval. An individually developed project related to the solution of a typical problem encountered by a manager in a technical environment. The problem is to be approved by the student’s graduate advisor and the results presented in open forum. Credit will not be awarded for both AEM and INT 821.

AEM 822 Industrial Internship. (3-6) A. Formerly INT 822. Prerequisite: departmental approval. Planned and supervised experience in industry in which the student will have the opportunity to observe and participate in manufacturing management activities. The experience must be for at least one semester and the plan of activities should be approved by the student’s graduate committee. Credit will not be awarded for both AEM and INT 822.
SUPPORTING COURSES

AEM 730  Design of Experiments.  (3) A.  Formerly INT 730. Prerequisite: AEM 202. Principle and practices of efficient experiment design for industry. Topics include the philosophy of experiment design, comparison of various designs, hypothesis testing, and the analysis of data. Credit will not be awarded for both AEM and INT 730.

AEM 801 Economics for Lean Operations.  (3) A. Formerly INT 801. Prerequisite: ECO 230. Cost management, budgeting, accounting, capital planning, and other topics necessary for making effective economic decisions from a lean perspective. Quantitative methods and computer applications used to formulate decisions relating to operations. Credit will not be awarded for both AEM and INT 801.

CIS 826 Information Systems Applications.  (3) A. Computer literacy, management information systems, and computer applications in business using word processing, spreadsheets, presentation, and database software tools. Tools are demonstrated using problems in accounting, finance, marketing, management, and production. Cannot be used as an MBA elective.

CIS 850 Management of Information Systems.  (3) II. Prerequisite: Successful completion of any required prerequisite MBA foundation courses or departmental approval. Examines existing and emerging information technology within and among organizations. The focal points are infrastructure technologies, the role IT plays in business processes, and the manager’s role in developing, acquiring and managing information resources.

CIS 860 Contemporary Topics in Information Technology.  (3) A. Prerequisite: CIS 850. Topics include some of the following: office automation, telecommunications, decision support systems, knowledge-based systems, executive information systems and executive support systems. May be retaken to a maximum of six hours if topics are different.

CSC 720 Multimedia Systems and Forensics.  (3) A. Prerequisite: admission to the master’s degree program in computer science or to the master’s degree program in math (computer science option) or departmental approval. Integration of multimedia technologies, signal processing and compression of images, audio, and video, multimedia forensics and message hiding.
CSC 730 Concepts of Programming Systems. (3) A. Prerequisite: three hours of a programming language or equivalent. The top-down design of algorithms, structured programming, control structures, subprograms, files and lists. Programs will be written in a high level language.

CSC 738 Computer Crime and Forensics. 
(3) A. Study of computer crime and forensics. Computer criminal evidence collection, analysis, and handling; computer forensics tools; data acquisition; digital evidence control; Windows and linux systems investigation; email investigation; network forensics; computer forensic reporting.

CSC 744 Database Admin and Security. (3) A. Prerequisite: CSC 730 or departmental approval. This course covers database management system concepts, database system architecture, installation and setup, data management, performance monitoring and tuning, backup and recovery, database security models and management, database auditing.

CSC 747 Network Forensics and Investigation (3) A. Prerequisite: CSC 730 or departmental approval. Introduction to Windows network forensics. Topics include: Windows network structure; Windows password/authentication mechanisms; Windows ports and services; live-analysis techniques; Windows registry structure and evidence; Forensic analysis of events logs; Network forensics tools and reporting.

CSC 748 Personal Electronic Device Forensics. (3) A. Prerequisite: CSC730 or departmental approval. Introduction to personal electronic device forensics. Topics include architecture, functionality, operating systems and implementation of PEds (cell phones, Pdas, iPod, MP3 music players, gPS devices), recovering evidence from PEds, and hostile forensic and boobytrapping techniques.

CSC 815 Computer Administration and Security. (3) A. Prerequisite: admission to the master’s degree program in computer science, the master’s degree program in math (computer science option) or departmental approval. Operating system concepts, installation and setup. System administration, managing system services, program security, viruses and worms, encryption, information security, security policies, legal and ethical issues.
CSC 825 Network Applications and Security. (3) A. Prerequisites: CSC 730 and CSC 815. Local area Networks, TCP/IP, Internet Protocols, Client/Server applications, dynamic web pages, Internet security, firewalls, virtual private networks, network attacks, Web and E-commerce security, wireless networking and security.

CSC 834 Software Engineering and Project Management I. (3) A. Prerequisite: admission to the master’s degree program in computer science, the master’s degree program in math (computer science option) or departmental approval. Planning, organizing, monitoring, and controlling the implementation of a software project.

CSC 860 System Programming and Administration. (3) A. Prerequisite: CSC 730. Operating system concepts, concurrent programming, scheduling, security, recovery, methods and languages for operating system management. Layering protocols for computer networks, inter-process communications, TCP/IP Internet protocols, Web programming, and Web server management. Credit does not apply toward the M.S. degree in Mathematical Sciences.

EAD 824 Technology and Leadership Practices for Program Improvement. (3) I, II. The study of assessment, improvement, and application of computer technology and effective leadership practices in education. The focus of the course will be upon the use of technology and knowledge of “best” practices for educational improvements.

EDC 810 K-12 Ed/Tech: Critical Issues. (3) Online. Introduction to research about integration of technology into K-12 school systems. Students will also investigate current and future technology advancements in hardware, software, networking, support, and training. Basic issues relating to legal and ethical issues relative to technology will also be introduced.

GBU 850 Legal, Ethical, and Social Environment of Business. (3) A. Examines what the responsible business-person must know about the Common law, the regulatory environment, standards of ethical conduct, and the social responsibilities of the modern enterprise.

HLS 830 Hazards & Threats to Homeland Security. (3) A. Description and analysis of significant hazards and threats to national security, and community safety, such as disasters, catastrophes, accidents, epidemics, technological failures, and terrorism.
MGT 821 Survey of Management. (3) II.
the functions of planning, organizing, leading and controlling the organization. Includes an introduction to concepts of organization behavior and organization theory as applied to the domestic/international business environments. Cannot be used as an MBA elective.

MGT 850 Leading and Managing Organizations. (3) I. Prerequisite: admission into the MBA program and successful completion of any required prerequisite MBA foundation courses or departmental approval. advanced study of the issues and personal skills required to effectively lead and manage individuals, teams, and the organization. topics include acquiring, energizing, and utilizing human capital in a global, competitive environment.

MKT 825 Survey of Marketing. (3) II.
Survey of marketing concepts. Major marketing institutions, the marketing mix, and environmental forces are examined. International and societal approaches weighted significantly. Case studies and outside reading reports are used to extend and demonstrate concepts. Cannot be used as an MBA elective.

QMB 850 Statistical Methods for Business.
(3) A. Prerequisite: admission into the MBA program and successful completion of any required prerequisite MBA foundation courses or departmental approval. this course focuses on statistical model selection, model building, forecasting, and the interpretation of statistical results for decision making. Emphasizes critical thinking and analysis skills.

SSE 827 Issues in Security Management. (3) A.
Survey of salient issues and concerns confronting security managers. Examines the application and contribution of various management concepts and philosophies to assets protection issues such as information security, personnel protection, threat analysis, technological adaptation, and resource allocation.

SED 712 Computer Technology with Exceptional Populations. (3) I. Prerequisites: completed College of Education computer literacy requirement and introductory course in special education, or instructor approval. Educational applications of computer technology with handicapped individuals, infants through adult. Identification, evaluation, and operation of software, hardware, and adaptive devices in accordance with ethical practices. (lec/lab)
STA 700 Applied Statistical Inference. (3) A.
designed for students in all areas. a general background
in statistical methods including normal distribution, point
and interval estimation, hypothesis testing, regression,
analysis of variance, and software packages. Credit does
not apply toward the M.S. degree requirements.

STA 701 Nonparametric Statistics. (3) A.
Simple, efficient nonparametric methods without
normality assumptions. tests, estimation of proportions,
medians, two-sample location/dispersion, one and
two-way layout, independence, regression, and use of
software. It is strongly recommended that students have
completed a statistics course

TEC 867 Research in Technology. (3) A.
Student must have the independent study proposal form
approved by faculty supervisor and department chair
prior to enrollment. Independent research in technology
supervised by the graduate advisor and other staff
members. topic must be approved before registration. May
be retaken to a maximum of six hours.
Apply for Admission to EKU Graduate School
http://gradschool.eku.edu/apply

- Fill out as much of the application as possible. The application will be submitted to the EKU Graduate School and as part of the process they will contact the Coordinator of the Graduate Program within our department, Dr. Dennis Field.
- The deadlines for admission to the graduate school are available at: http://gradschool.eku.edu/graduate-application-deadlines
- EKU Grad school information: http://gradschool.eku.edu/

- The Degree you will be applying for admission to is: Master of Science (MS)
- The Degree Program is: Applied Engineering and Technology Management
- The Concentration is: Network Security Management (this option may not be available at present)
- Plan on taking the GRE* at an early date and have the scores reported to EKU. While filling out the application form you may indicate when you plan to take the GRE.

*Note about the GRE:
The GRE (verbal and math) sections scores are used along with the GPA for determining if a student will qualify for full admission to the graduate program. Essentially:

Overall GPA \times (GRE verbal + GRE math) should be greater than 2200.

Assuming a student had a GPA of 3.0, then the minimum \( (GRE \text{ verbal} + \text{math}) \) needed = \( 2200/3 = 734 \)

Information regarding the GRE verbal portion:
http://www.ets.org/gre/revised_general/prepare/verbal_reasoning

Information regarding the GRE math portion and abbreviated review guide:
http://www.ets.org/gre/revised_general/prepare/quantitative_reasoning


The format for the GRE has changed recently so make sure you use the most recent guide available while preparing for it. Several GRE guides are available through Amazon or other online retailers.
Semester-by-Semester Schedule
(Part-time* Students taking 2 courses/semester)

1st semester (Fall)
- 3, NSM 815 – Foundations of Network Security
- 3, AEM 804 – Project Management

2nd semester (Spring)
- 3, NSM 845 – Advanced Server Security
- 3, Select one of the following supporting courses approved for NSM: Select from AEM 730, 801, CIS 826, 850, 860, CSC 720, 730, 738, 744, 747, 748, 815, 825, 834, 860, EAD 824, EDC 810, GBU 850, HLS 830, MGT 821, 850, MKT 825, QMB 850, SED 712, SSE 827, STA 700, 701, TEC 867, and other courses by advisement

3rd semester (Summer)
- 3, TEC 830 – Creative Problem Solving

4th semester (Fall)
- 3, NSM 865 – Wireless & Mobile Security
- 3, Select one of the following supporting courses approved for NSM: Select from AEM 730, 801, CIS 826, 850, 860, CSC 720, 730, 738, 744, 747, 748, 815, 825, 834, 860, EAD 824, EDC 810, GBU 850, HLS 830, MGT 821, 850, MKT 825, QMB 850, SED 712, SSE 827, STA 700, 701, TEC 867, and other courses by advisement

5th semester (Spring)
- 3, NSM 895 – Special Topics in NSM
- 3, (AEM 820 and 821), or (AEM 822 and/or 839) – Project Proposal or Approved Cooperative education

6th semester (Summer)
- 3, (AEM 820 and 821), or (AEM 822 and/or 839) – Project Proposal or Approved Cooperative education
- 0, GRD 867c or 868b – Exit Exam (0 credit)

The list of courses for the NSM program is listed below:

*Note regarding part-time students:
Typically NSM graduate students are working professionals taking grad classes alongside their regular work schedule. Even 2 grad classes a semester may keep one quite busy, as these classes require a lot of self-study, writing, and analysis on a regular basis. At the graduate level 3 classes per semester is regarded as full-time load. You may complete your program sooner by taking 3 classes per semester, provided sufficient number of the classes are offered.

http://tinyurl.com/7m5r84f
Semester-by-Semester Schedule
(Full-time* Students taking 3 courses/semester)

1st semester (Fall)
- 3, NSM 815 – Foundations of Network Security
- 3, NSM 865 – Wireless & Mobile Security
- 3, AEM 804 – Project Management

2nd semester (Spring)
- 3, NSM 845 – Advanced Server Security
- 3, NSM 895 – Special Topics in NSM
- 3, Select one of the following supporting courses approved for NSM: Select from AEM 730, 801, CIS 826, 850, 860, CSC 720, 730, 738, 744, 747, 748, 815, 825, 834, 860, EAD 824, EDC 810, GBU 850, HLS 830, MGT 821, 850, MKT 825, QMB 850, SED 712, SSE 827, STA 700, 701, TEC 867, and other courses by advisement

3rd semester (Summer)
- 3, TEC 830 – Creative Problem Solving

4th semester (Fall)
- 3, Select one of the following supporting courses approved for NSM: Select from AEM 730, 801, CIS 826, 850, 860, CSC 720, 730, 738, 744, 747, 748, 815, 825, 834, 860, EAD 824, EDC 810, GBU 850, HLS 830, MGT 821, 850, MKT 825, QMB 850, SED 712, SSE 827, STA 700, 701, TEC 867, and other courses by advisement
- 6, (AEM 820 and 821), or (AEM 822 and/or 839) – Project Proposal or Approved Cooperative education
- 0, GRD 867c or 868b – Exit Exam (0 credit)

The list of courses for the NSM program is listed below:

* Note regarding full-time students:
Owing to low enrollment it is possible that not all courses listed above may be offered in the semester indicated.

EKF NET Facebook page:
or
http://tinyurl.com/7m5r84f