EM COURSE OFFERINGS – SPRING 2020
See Timetable of Classes for more options

EM 500 Thesis
CRN  27294  Prof. Simonton  
CRN  28434  Prof. Yu

EM 501 Capstone
CRN  21978  UT Space Institute Campus
CRN  33293  Distance Education Campus
PROFESSOR:  Dr. Janice Tolk

EM 502 Registration for Use of Facilities
CRN  21979  Prof. Simonton  
CRN  29139  Prof. Yu

EM 533 Theory and Practice of Engineering Management
Sec.  001  CRN  21980  UT Space Institute Campus  
002  CRN  21981  UT Knoxville Campus  
003  CRN  21982  Distance Education Campus

TEXT:  Required: Organizational Behavior; Fred Luthans; McGraw-Hill Irvin; 13th Edition,  
TIME:  Monday  4:00 – 6:35 (Central time)  UTSI Room E-113
PROFESSOR:  Dr. Denise Jackson

Principles of engineering management, including: business and organization design, culture, leadership,  
marketing and competition in global economy, motivation and performance management,  
empowerment, organizational behavior, and diversity. Systems thinking, learning organizations, and  
systems dynamics modeling. Principle application to work settings and case studies.

EM 534 Financial Management for Engineering Managers
Sec.  001  CRN  21984  UT Space Institute Campus  
002  CRN  21985  UT Knoxville Campus  
003  CRN  21986  Distance Education Campus

TEXT:  TBA
TIME:  Monday  10:00am – 12:30pm (Central time)  UTSI Room E-113
PROFESSOR:  Dr. Andrew Yu

Financial and managerial accounting in engineering and technology management. Transaction recording,  
financial statements, ratios and analysis, activity-based accounting, and standard practices for costing,  
budgeting, assessment, and control.
EM 600 Doctoral Research/Dissertation
Sec.     001 CRN  25030 UT Space Institute Campus     Dr. James Simonton
         003 CRN  28444 UT Space Institute Campus     Dr. Andrew Yu
         006 CRN  32386 Distance Education Campus     Dr. James Simonton
         007 CRN  33291 Distance Education Campus     Dr. Andrew Yu

EM 601 Systems Theory & Engineering
Sec.     001 CRN  31865 UT Space Institute Campus
         002 CRN  31866 UT Knoxville Campus
         003 CRN  31867 Distance Education Campus

         Amazon ISBN #13: 978-0470405482

Time:    Tuesday 10:30am – 12:30pm (Central time)   UTSI Room E-113
PROFESSOR:    Dr. James Simonton

Technology course that will examine theoretical foundations of General System Theory applied to engineering and organizational enterprises addressing issues concerning systems, the effectiveness of organizations in the context of traditional management related issues, as well as incorporating the critical impact of systems thinking on the socio-technical environment. Among the topics to be covered in the course are: the meaning of General Systems Theory (GST); GST and the unity of science; the concept of Equifinality; the characteristics and modeling of open systems; the concepts of the Learning Organization; the principle of Leverage; building Learning Organizations; and issues related to Socio-Technical Systems. Systems Engineering focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem including operations, performance, test, manufacturing, cost, and schedule. This subject emphasizes the links of systems engineering to fundamentals of decision theory, statistics, and optimization. (RE) Prerequisite(s): 533.

IE COURSES OFFERINGS – SPRING 2020

IE 517 Reliability of Lean Systems
SEC.      001 CRN  26634 UT Knoxville Campus
         002 CRN  26635 Distance Education Campus
         003 CRN  26670 UT Space Institute Campus

TEXT:    TBA
TIME:    Monday & Wednesday – 12:20 pm – 1:35 pm (Eastern time) – John D. Tickle Building Room 410
PROFESSOR:    Dr. Rapinder Sawhney

Course is divided into two major components. First half of the course will focus on introducing the students to the concepts of reliability and maintainability and the impact of lean on the reliability of complex systems. The concepts of reliability engineering are utilized to address lean system failures, including equipment failures, human failures, material failures and scheduling failures. Will develop the ability to design systems that are both lean and reliable. The second half of the course will introduce
students to specific case studies of systems failures and ask students to develop solutions by considering different dimensions including financial, technical feasibility, risk, safety, security and others. Multi-criteria decision making methodologies will be presented to allow students to make decisions when different criteria lead to conflicting solutions.

(RE) Prerequisite(s): 516. Recommended Background: Background in lean and reliability.

**IE 518 Advanced Engineering Economic Analysis**

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TEXT: TBA

TIME: Monday & Wednesday – UTK Campus 2:10 pm – 3:25 pm (Eastern Time)

PROFESSOR: Dr. Reid L. Kress

Application of engineering economic analysis in complex decision situations. Inflation and price changes; uncertainty evaluation using non-probabilistic techniques; capital financing and project allocation; evaluations involving equipment replacement, investor-owned utilities, and public works projects; probabilistic risk analysis including computer simulation and decision trees; multi-attribute decision analysis; and other advanced topics.

(RE) Prerequisite(s): 405 Recommended Background: Statistics 251.

**IE 522 Optimization Methods for Engineering Managers**

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TEXT: TBA

TIME: Tuesday & Thursday – UTK Campus 11:10 am – 12:25 am (Eastern time) – Tickle Bldg Room 410

PROFESSOR: TBA

Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and dynamic programming.

Recommended Background: Linear Algebra.

**IE 529 Application Linear Algebra in Engineering Systems**

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TEXT: TBA

TIME: Tuesday & Friday – UTSI Campus 9:30 – 10:45am (Central time) – Room E-111

PROFESSOR: Dr. Monty Smith

Fundamental concepts of linear algebra to problems in engineering systems: steady state and dynamic systems. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of system matrix, eigenvalue problems, and similarity transformations in solving difference and differential equations; numerical stability aspects of various algorithms; application of linear algebra concepts in control and optimization studies; introduction to linear programming. Computer projects.
Cross-listed: (See Chemical and Biomolecular Engineering 529.)
Comment(s): Graduate standing or consent of instructor required.

IE 550 Graduate Seminar
SEC. 001 CRN 25038 UT Knoxville Campus
002 CRN 25039 Distance Education Campus
003 CRN 26671 UT Space Institute Campus
TIME: Friday – UTK Campus 2:30 pm – 3:20 pm (Eastern Time) – Tickle Building Room 410
PROFESSOR: Dr. Mingzhou Jin

IE 610 Heuristics in Optimization
SEC. 001 CRN 28512 UT Knoxville Campus
002 CRN 28513 Distance Education Campus
003 CRN 28514 UT Space Institute Campus
TEXT: TBA
TIME: Tuesday & Thursday – UTK Campus 12:40 pm – 1:55 pm (Eastern Time) – Tickle Bldg Room 410
PROFESSOR: Dr. Oleg Shylo

Basic models and algorithms in stochastic processes and their Engineering application: the renewal theory, discrete-time and continuous-time Markov Chains, Queuing theory, and Markovian Decision Processes.
(DE) Prerequisite(s): 516.
Recommended Background: Probability.
Registration Restriction(s): Minimum student level – graduate.