

## FALL 2019 – COURSE OFFERINGS

### EM 500 Thesis

Professor: Dr. James Simonton CRN 47446

Professor: Dr. Andrew Yu CRN 49097

### EM 501 Capstone Project

Professor: Dr. Janice Tolk CRN 42980

### EM 502 Registration for Use of Facilities for EM Students

Professor: Dr. James Simonton CRN 42981

Professor: Dr. Andrew Yu CRN 49099

### EM 532 Productivity and Quality Engineering

Time: TBD

Professor: Dr. Tonya Brown

Sections: 001 CRN 44956 UT Space Institute Campus  
003 CRN 44958 UT Knoxville Campus  
004 CRN 44959 Distance Education Campus

Textbook: TBD

Course Description: Productivity and quality measures defined and used to analyze current competitive position of important sectors of American industry with respect to national and international competition. Study of management theorists and systems which promote or inhibit productivity or quality improvements.

### EM 537 Analytical Methods for Engineering Managers

Time: Monday – 4:00-6:30pm – E113

Professor: Dr. Denise Jackson

Sections: 001 CRN 44960 UT Space Institute Campus  
004 CRN 44963 Distance Education Campus  
006 CRN 52998 UT Knoxville Campus

Textbook: *Operations Management*, William Stevenson, McGraw-Hill, January 7, 2014, Edition: 12<sup>th</sup>  
ISBN-13: 978-0078024108, ISBN-10: 0078024102

Course Description: Survey of management analysis and control systems through industrial engineering techniques. Qualitative and quantitative systems: methods analysis, work measurement, incentive systems, wage and salary development, production and inventory control, facility layout, linear programming, and applied operations research techniques.

### **EM 539 Strategic Management in Technical Organizations**

Time: Tuesday, 10:00-12:30pm – E113

Professor: Dr. Sandra Affare

Sections: 001 CRN 44964 UT Space Institute Campus  
003 CRN 44966 UT Knoxville Campus  
004 CRN 44967 Distance Education Campus

Textbook: *Strategic Management Concepts*, Frank Rothaermel, 4<sup>rd</sup> Edition, McGraw-Hill,  
ISBN - 13: 978-1260092370, ISBN-10: 1260092372

Course Description: Strategic planning process and strategic management in practice; corporate vision and mission; product, market, organizational, and financial strategies; external factors; commercialization of new technologies; and competition and beyond.

### **EM 543 Legal & Ethical Aspects of Engineering Management**

Time: Thursday, 10:00-12:30 – E113

Professor: Dr. Sandra Affare

Sections: 001 CRN 50844 UT Space Institute Campus  
004 CRN 53008 UT Knoxville Campus  
005 CRN 53009 Distance Education Campus

Textbook: *Business Ethics (Ethical Decision Making and Cases)* 12th Edition, O.C. Ferrell, John Fraedrich, and Linda Ferrell, ISBN: 978-1-337-61443-6

Course Description: Legal aspects imposed by government and ethical considerations in engineering practice. Selected readings, lecture, discussion, and student presentations. Current topics from government and industry.

### **EM 600 Doctoral Research and Dissertation**

Professor: Dr. James Simonton

Sections: 001 CRN 44970 UT Space Institute Campus  
004 CRN 53256 Distance Education Campus

Professor: Dr. Andrew Yu

Sections: 002 CRN 44972 UT Space Institute Campus  
005 CRN 53257 Distance Education Campus

### **EM 602 Supply Chain & Logistics Systems Engineering**

Time: Monday, 10:00 – 12:30 – E113

Professor: Dr. Andrew Yu

Section: 001 CRN 51849 UT Space Institute Campus  
003 CRN 51851 UT Knoxville Campus  
004 CRN 53254 Distance Education Campus

Textbook: Instructor will provide electronic files through Canvas

This course introduces the concepts, methods and techniques of supply chain management and logistics support from a systems engineering perspective. The discussion of different topics in the course will focus on the different stages in a system life cycle. (RE) Prerequisite(s): 537

### **Industrial Engineering Courses Offerings**

For complete listing of IE courses see Timetable of Classes -

[https://bannersb.utk.edu/kbanpr/bwckschd.p\\_get\\_crse\\_unsec](https://bannersb.utk.edu/kbanpr/bwckschd.p_get_crse_unsec)

## **IE 516 Statistical Methods in Industrial Engineering**

Time: Tuesday & Thursday – 12:40pm – 1:55pm EST – UTK classroom, 410 Tickle Bldg.

Professor: Dr. Oleg Shylo

Section: 001 CRN 45037 UT Knoxville campus  
002 CRN 45038 Distance Education Campus  
003 CRN 45039 UT Space Institute Campus

Textbook: TBD

Course Description: Application of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement; descriptive statistics and distribution theory; relationship between statistical process control techniques and classical statistical tools; parameter estimation and hypothesis testing; goodness-of-fit testing; linear regression and correlation; analysis of variance; single and multiple factor experimental design. *Recommended Background: Statistics 251 or equivalent.*

## **IE 526 Advanced Systems Modeling & Simulation**

Time: Tuesday & Thursday – 9:40 – 10:55 am EST – UTK classroom, 410 Tickle Bldg.

Professor: TBA

Section: 001 CRN 45048 UT Knoxville Campus  
002 CRN 45050 Distance Education Campus  
003 CRN 45051 UT Space Institute Campus

Textbook: TBD

Course Description: Modeling of discrete, continuous, and combined systems using current simulation software. Development of flexible simulation models to enhance accessibility of simulation models for experimentation. Development of distributed simulation models to represent and test production and supply chain systems.

## **IE 527 Lean Production Systems**

Time: Monday & Wednesday – 9:45 – 11:15 am EST – UTK classroom, 410 Tickle Bldg.

Professor: Dr. Rapinder Sawhney

Section: 004 CRN 52992 Distance Education Campus

Strategies for planning, development and implementation of Lean. Emphasis on integration of people, technology, processes and information dimensions (including product development, production and extended supply chain) into unified frameworks. Applications will be implemented into industry with work to further develop lean principles.

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

Time: Tuesday & Friday – 9:30 – 10:45am CST – UTSI classroom

Professor: Dr. Monty Smith

Section: 001 CRN 43205 UT Knoxville Campus Lectures posted online  
002 CRN 46570 UT Space Institute Campus

003 CRN 52425 Distance Education Campus  
Textbook: TBD

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**

Time: Friday – 2:30 – 3:30pm EST – UTK classroom, 402 Tickle Bldg.

Professor: Dr. Ming Jin

Section: 001 CRN 45416 UT Knoxville Campus  
002 CRN 45417 Distance Education Campus  
003 CRN 45418 UT Space Institute Campus

Seminar provides an opportunity for Master's and Doctoral students to acquaint themselves with research being conducted by both faculty and graduate students in the Industrial and Information Engineering Department, as well as select campus-wide and off-campus researchers from both academia and industry. Research work and relevant results are presented in a professional environment that promotes continued interaction among interested parties. Presentations are not restricted to thesis and dissertation work. Grading Restriction: Satisfactory/No Credit grading only.

### **IE 604 Network Flow Optimization**

Time: Tuesday & Thursday – 2:10 – 3:25pm EST – UTK classroom, 410 Tickle Bldg.

Professor: Dr. Hugh Medal

Section: 001 CRN 47200 UT Knoxville Campus  
002 CRN 47201 Distance Education Campus  
003 CRN 47202 UT Space Institute Campus

Fundamental theory, algorithms, and applications of deterministic network-flow models, and analytical procedures for a special class of stochastic networks (GERT networks). Linear programming and its relationship to network analysis. Algorithms for various kinds of shortest and k-shortest path models. Labeling procedures for maximal flows in capacitated networks. The Out-Of-Kilter algorithm for cost-minimization flow models. Primal Simplex network optimization procedures for pure and generalized networks. Traveling-Salesman problem algorithms with extensions to multiple salesmen. CPM, PERT and network-flow models in project management. Introduction to multi-commodity networks. Extensive use of network optimization software.

*(DE) Prerequisite(s): 522. Registration Restriction(s): Minimum student level – graduate.*