

## FALL 2017 – COURSE OFFERINGS

### EM 500 Thesis

Professor: Dr. James Simonton CRN 47874

Professor: Dr. Andrew Yu CRN 49671

### EM 501 Capstone Project

Professor: Dr. Janice Tolk CRN 43039

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

Professor: Dr. James Simonton CRN 43040

Professor: Dr. Andrew Yu CRN 49676

### EM 532 Productivity and Quality Engineering

Professor: Dr. Janice Tolk CRN 45208 Prerecorded

#### Textbooks:

1. *Improving Performance: How to Manage the White Space on the Organization Chart*, Geary A. Rummler and Alan P. Brache, 3<sup>rd</sup> Edition
2. *The Principles of Scientific Management*, Taylor, F. W. (1998, 1911). Mineola, NY: Dover Publications, Inc.
3. *The New Economics for Industry, Government, Education*, Deming, W. E., 2<sup>nd</sup> Edition (1994). Cambridge, MA: The MIT Press.

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: Tuesday – 4:00-6:30pm – E113

Professor: Dr. Denise Jackson

Sections: 001 CRN 45212 UTSI students participating at Tullahoma

002 CRN 45213 UTSI students participating elsewhere

003 CRN 45214 UTK students participating elsewhere

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

Professor: Dr. Janice Tolk CRN 45216 Prerecorded

Textbook: *Strategic Management Concepts*, Frank Rothaermel, 3<sup>rd</sup> Edition, McGraw-Hill,  
ISBN - 13: 978-1259420474, ISBN-10: 1259420477

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 542 Design of Experiments**

Time: Tuesday – 10:00 – 12:30am – E111

Professor: Dr. Andrew Yu

Sections: 001 CRN 49365 UTSI students participating at Tullahoma  
002 CRN 49673 UTSI students participating elsewhere  
003 CRN 49674 UTK students participating elsewhere

Text: *Design and Analysis of Experiments*, Douglas C. Montgomery, 8<sup>th</sup> edition, John Wiley & Sons,  
ISBN-13: 978-1118146927, ISBN-10: 1118146921

Course Description: Methodology for experiments in product, service, and process improvements. Factorial experiments, screening designs, variance reduction, and other selected topics for engineering managers. Taguchi philosophy and concepts. Optimization and response surface methods. Case studies.  
(RE) Prerequisite(s): *Industrial Engineering 516*.

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

Time: Monday – 4:00 – 6:30pm – E113

Professor: Dr. Joe Costa

Section: 001 CRN 51755 UTSI students participating at Tullahoma  
002 CRN 51762 UTSI students participating elsewhere  
003 CRN 51763 UTK students participating elsewhere

Text: *Engineering Ethics: Concepts and Cases*, Jr. Charles E. Harris and Michael S. Pritchard  
Wadsworth Publishing, 5th ed (January 9, 2013)  
ISBN-10: 1133934694 ISBN-13: 978-1133934684

Optional text: *Legal Aspects of Managing Technology*, Lee B. Burgunder, West Legal Studies in Business  
Academic, South-Western College/West; 5 edition (January 20, 2010)  
ISBN-10: 1439079811 ISBN-13: 978-1439079812

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 CRN 45222

Professor: Dr. Andrew Yu

CRN 45224

## **EM 601 Systems Theory and Engineering**

Time: TBA

Professor: Dr. Sandra Affare

Sections: 001 CRN 51781 UTSI students participating at Tullahoma  
002 CRN 51782 UTSI students participating elsewhere  
003 CRN 51783 UTK students participating elsewhere

Textbook: *Systems Engineering and Analysis*, Benjamin Blanchard and Wolter Fabrycky, 5<sup>th</sup> edition, ISBN #13: 9780132217354

Course Description: 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.*

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

## **Industrial Engineering Courses Offerings**

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

Time: Monday & Wednesday – 11:10am – 12:25pm EST – UTK classroom, 410 Tickle Bldg.

Professor: Dr. Oleg Shylo

Section: 001 CRN 45289 UTK students participating at Knoxville  
002 CRN 45290 UTK students participating elsewhere  
003 CRN 45291 UTSI students participating elsewhere

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

Professor: Dr. Xueping Li

Section: 001 CRN 45300 UTK students participating at Knoxville  
002 CRN 45302 UTK students participating elsewhere  
003 CRN 45303 UTSI students participating elsewhere

Textbook: *The Big Book of Simulation Modeling: Multimethod Modeling with Anylogic 6*, Andrei Borshchev, AnyLogic North America Publisher (June 2013), ISBN-10: 0989573176 or ISBN-13: 978-0989573177

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 529 Application of Linear Algebra in Engineering Systems**

Time: Tuesday & Friday – 9:30 – 10:45am CST – UTSI classroom  
Professor: Dr. Monty Smith  
Section: CRN 46937 Lectures posted online  
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 45694 UTK students participating in Knoxville  
002 CRN 45695 UTK students participating elsewhere  
003 CRN 45696 UTSI students participating elsewhere

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.*

For complete listing of IE courses see Timetable of Classes - [https://bannersb.utk.edu/kbanpr/bwckschd.p\\_disp\\_dyn\\_sched](https://bannersb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched)