

## SPRING 2010

### ENGINEERING MANAGEMENT

**EM 501 CAPSTONE PROJECT (3 - 6)**  
SEC. 001 Dr. Gregory Sedrick  
SEC. 002 Dr. Denise Jackson

Application-oriented project to show competence in major academic area. Enrollment limited to Engineering Management students in non-thesis program. May be repeated. Maximum 6 hours.

**EM 502 REGISTRATION FOR USE OF FACILITIES (1 – 15)**  
SEC. 001 Dr. Gregory Sedrick  
SEC. 002 Dr. Denise Jackson

Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before a degree in Industrial Engineering (Engineering Management) is completed. May not be used toward degree requirements.

**EM 533 THEORY AND PRACTICE OF ENGINEERING MANAGEMENT (3)**  
SEC. 001 UTSI Students participating at Tullahoma or Oak Ridge  
SEC. 002 UTSI Students participating elsewhere  
SEC. 003 UTK Students participating at Knoxville DE Classrooms  
SEC. 004 UTK Students participating elsewhere

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
TIME & ROOM: Thursday 4:00 – 6:35 E113  
PROFESSOR: Dr. Gregory Sedrick

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 (3)**  
SEC. 001 UTSI Students participating at Tullahoma or Oak Ridge  
SEC. 002 UTSI Students participating elsewhere  
SEC. 003 UTK Students participating at Knoxville DE Classrooms  
SEC. 004 UTK Students participating elsewhere

TIME & ROOM: Tuesday 4:00 – 6:35 E113  
TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
PROFESSOR: Dr. Greg Sedrick

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 541 MANAGING CHANGE AND IMPROVEMENT IN TECHNICAL ORGANIZATIONS (3)**  
 SEC. 001 UTSI Students participating at Tullahoma or Oak Ridge  
 SEC. 002 UTSI Students participating elsewhere  
 SEC. 003 UTK Students participating at Knoxville DE Classrooms  
 SEC. 004 UTK Students participating elsewhere  
 TIME & ROOM: Monday 4:00 – 6:35 E113  
 TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
 PROFESSOR: Dr. Denise Jackson

Current topics, theories, and applications for managing change and innovation of performance improvement in organizations. Multi-initiative approaches: quality management, organizational effectiveness, employee empowerment, performance measurement, and application of statistical tools and techniques. Self-assessment for performance excellence. Change agent, team building, and leadership issues. Case studies.

**EM 691 ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)**  
 Section 001 Dr. Gregory Sedrick

### **INDUSTRIAL ENGINEERING**

**IE 500 THESIS (1-15)**  
 SEC. 002 Dr. Denise Jackson as main advisor  
 SEC. 006 Dr. Gregory Sedrick as main advisor

**IE 514 ADVANCED INFORMATION SYSTEMS ANALYSIS (3)**  
 SEC. 001 All Students participating at Knoxville  
 SEC. 002 UTK Students participating elsewhere  
 SEC. 003 UTSI Students participating at Tullahoma or Oak Ridge  
 SEC. 004 UTSI Students participating elsewhere  
 TIME: CENTRA  
 TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
 PROFESSOR: Dr. Xueping Li

Systems analysis and systems control concepts applied to systems of information. Role of IE in office and factory of future. Management support systems, decision support systems, and integrated support systems.

**IE 518 ADVANCED ENGINEERING ECONOMIC ANALYSIS (3)**  
 SEC. 001 UTK Students participating at Knoxville DE Classrooms  
 SEC. 002 UTK Students participating elsewhere  
 SEC. 003 UTSI Students participating at Tullahoma or Oak Ridge  
 SEC. 004 UTSI Students participating elsewhere  
 TIME & ROOM: Wednesday 4:00 – 6:35 E113  
 TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)  
 PROFESSOR: Dr. Joseph Wilck

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.

*Prerequisite: EM 537 OR both Engineering Economy (IIE 405 or equivalent) and Probability and Statistics for Scientists and Engineers, (IIE 205 or equivalent).*

**IE 522 OPTIMIZATION METHODS IN INDUSTRIAL ENGINEERING (3)**

SEC. 001 All Students participating at Knoxville  
SEC. 002 UTK Students participating elsewhere  
SEC. 003 UTSI Student participating in Tullahoma or Oak Ridge  
SEC. 004 UTSI Students participating elsewhere

TIME: CENTRA

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)

PROFESSOR: Dr. Charles Aiken

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

**IE 527 LEAN PRODUCTION SYSTEMS (3)**

SEC. 001 All Students participating at Knoxville  
SEC. 002 UTK Students participating elsewhere  
SEC. 003 UTSI Students participating at Tullahoma or Oak Ridge  
SEC. 004 UTSI Students participating elsewhere

TIME: CENTRA

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)

PROFESSOR: Dr. Rupey Sawhney

Characteristics and performance of mass and lean production systems. Lean production concepts and principles. Planning, designing and implementing lean production systems: line balancing, set-up time reduction, cost management, maintenance support and other selected topics. Application at enterprise level to achieve strategic competitive goals. *Prerequisite: 515 or consent of instructor.*

**IE 529 APPLICATION OF LINEAR ALGEBRA IN ENGINEERING SYSTEMS (3)**

SEC. 001 (Video Recorded) (Same as CBE/ECE/MSE/ME 529)

TEXT: [http://www.utsi.edu/academics/ieandem/student\\_services.htm](http://www.utsi.edu/academics/ieandem/student_services.htm)

TIME: Monday & Thursday 9:45 – 11:00 E113

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.

*(Same as Biomedical Engineering 529; Industrial Engineering 529; Materials Science and Engineering 529; Mechanical Engineering 529). Comment(s): Graduate standing or consent of instructor required.*

**Comments:** Methods of linear algebra as applied to engineering. Topics to be covered include: systems of linear equations, matrices, solutions of linear equations, Gaussian elimination, vector spaces, linear transformations, orthogonality, least-squares approximations, determinants, eigenvalues and eigenvectors, positive definite matrices, singular value decomposition, and numerical computational methods. Course assignments will consist of pencil-and-paper exercises and numerical exercises involving MATLAB. Students registering for this course are assumed to have access to at least the Student Edition of MATLAB.

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| <b>IE</b> | <b>592</b> | <b>SPECIAL TOPICS IN INDUSTRIAL ENGINEERING (1-3)</b> |
|           |            | SEC. 002 Dr. Gregory Sedrick                          |
| <b>IE</b> | <b>600</b> | <b>DOCTORAL RESEARCH/DISSERTATION (3-15)</b>          |
|           |            | SEC. 002 Dr. Denise Jackson                           |
|           |            | SEC. 006 Dr. Gregory Sedrick                          |
| <b>IE</b> | <b>691</b> | <b>ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)</b>  |
|           |            | SEC. 002 Dr. Gregory Sedrick                          |
| <b>IE</b> | <b>692</b> | <b>ADVANCED TOPICS IN INDUSTRIAL ENGINEERING (3)</b>  |
|           |            | SEC. 001 Sedrick                                      |