

# CALL FOR SENIOR DESIGN PROJECTS

FOR MANAGEMENT SCIENCE MAJORS

Each spring at SMU's Lyle School of Engineering, teams of Management Science seniors perform consulting projects for local industry, government, and non-profit organizations. The objective of their EMIS 4395 *Senior Design* course is to put into practice the quantitative decision-modeling methods that they have been studying, as a preview of life after graduation.

Under the direction of their supervising professor, these groups typically:

- meet with client organizations to define and scope a project,
- design solution approaches,
- collect empirical data,
- develop and implement models,
- test and validate the models,
- apply the models to the empirical data,
- draw conclusions, and
- prepare recommendations for their clients.

Typical deliverables to the client are:

- a final report
- formal presentation
- any software created and data gathered

Client responsibilities:

- have suitable semester project involving mathematical or statistical modeling
- have time to meet with team
- provide helpful feedback

If you are interested in a management science team next spring for your organization, contact:  
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## ENGINEERING MANAGEMENT, INFORMATION, AND SYSTEMS (EMIS)

DEPARTMENT OF THE  
SMU LYLE SCHOOL OF ENGINEERING

### EXAMPLE TOPIC AREAS

- Optimization models
- Computer-based simulation models
- Forecasting models
- Decision analysis applications
- Supply-chain management
- Distribution & logistics systems
- Network optimization
- Integrated production and distribution models
- Facilities location and layout
- Non-repetitive operations methods: job-lot manufacturing, aggregate scheduling, job sequencing and scheduling
- Repetitive operations management: line-balancing techniques, queuing/waiting lines
- Project Management
- Inventory/materials management
- MRP systems
- Just-in-time systems
- Quality management/control
- Statistical quality control
- Process improvement and cycle time reduction
- Benchmarking
- System engineering and design
- Financial engineering
- Decision-support systems
- Economic analyses
- Business process modeling

*See other side for a sample of previous senior design project clients and topics*

*Example project descriptions:  
<http://lyle.smu.edu/emis/design/>*



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## EXAMPLE MANAGEMENT SCIENCE SENIOR DESIGN PROJECTS AND CLIENTS

| CLIENT   | PROJECT TITLE  |
|--|--|
| Alcatel Network Systems                                    | Arizona Telecommunications Network Design  |
| American Airlines  | Fleet Planning and Substitution Model  |
| American Airlines  | Ticket Counter Staffing Simulation for DFW Airport   |
| Baylor University Medical Center                           | Capacity Planning for the 2RSU Pre-operating Facility  |
| Baylor University Medical Center                           | Improving Emergency Room Effectiveness via Process Simulation  |
| Brinker International                                      | Production, Distribution, and Capacity Planning Models   |
| Capstone Financial Services                                | Financial Asset Allocation and Optimization  |
| City of Dallas   | Routing Hazardous Materials Through Dallas' Central Business District                                |
| City of Dallas: 911 Call Center                            | Dispatching Model for Mobile Intensive Care Units  |
| Coca-Cola Distribution of N. TX                            | Real-time Vending Inventory Optimization   |
| Dallas County  | A Study of Computer-Assisted Jury Selection  |
| Dallas Police Department, Youth and Family Crimes Division | A Model for Predicting Outcomes and Assessing the Effectiveness of First-Offender Programs           |
| Dallas Water Utilities                                     | Statistical Analysis of Water Main Breaks  |
| Dallas Zoo   | Composting Feasibility Study   |
| Federal Reserve Bank of Dallas                             | Cost-Benefit Analysis of Research Support Systems  |
| Federal Reserve Bank of Dallas                             | Longitudinal Study and Analysis of U.S. Bank Mergers   |
| Freres Plywood Manufacturing                               | Optimizing Plywood Product Production  |
| Frito-Lay  | Sam's Club-Building Inventory-Level Modeling   |
| Juliette Fowler Home                                       | Automated Generation of Seniors' Activity Schedules to Meet State Guidelines                         |
| Kodak  | Tracking Productivity at Kodak's Technical Support Center  |
| Lockheed Martin Missiles & Fire Control                    | Modeling the Infrastructure Impact of an EMP Event   |
| Meals on Wheels  | Design and Implementation of a Multiple-Vehicle Routing Scheme (national student paper award winner) |
| NASA, Johnson Space Center                                 | Production Center Analyses & Recommendations   |
| Pacesetter Natural Gas Marketing                           | Optimized Natural Gas Contract Portfolio Models  |
| Pagenet  | Early-warning System to Predict Network Saturation   |
| Pizza Hut, Inc.  | Optimizing Bologna and Wiener Production   |
| Plano ISD  | Student Enrollment Forecasting Model   |
| Quest Energy Resources, Inc.                               | Natural Gas Marketing Strategy Optimization (national student paper award)                           |
| Raytheon   | Software Purchase Management Model   |
| Skin Ceuticals   | Automated Sales Forecasting Model  |
| SMU CSE Department   | Optimal Scheduling of Lab Assistants   |
| Southwest Airlines   | Modeling the Effect of Kiosk Layout on Passenger Check-in Efficiency                                 |
| State of Texas   | Gulf Freeway Evacuation Model  |
| TestChip Technologies                                      | Engineering Task Scheduling and Assignment Models  |
| Texas Plaza, Irving, TX                                    | Optimal Real Estate Project Phasing (published in <i>Interfaces</i> )                                |
| Towers Perrin  | Convenience Stores Scheduling System   |
| Un-sponsored   | Fundamentals: An Envelopment-Analysis Approach to Measuring the Managerial Quality of Mutual Funds   |
| UPS  | Sorting Hub Optimization Model   |
| Veterans Administration Hospital, Dallas, TX               | Optimized Nurse Scheduling (national student paper award)  |
| Wadley Blood Center  | Analysis of Apheresis Donor Program  |
| Williams Technologies                                      | Locating Hubs for a New Transmission Business  |

More information is available at: [faculty.smu.edu/barr/design](http://faculty.smu.edu/barr/design)