



**USC Viterbi**

School of Engineering  
*Daniel J. Epstein Department of  
Industrial and Systems Engineering*

**[www.ise.usc.edu](http://www.ise.usc.edu)**

# **Industrial and Systems Engineering Master's Program Handbook 2026 – 2027**

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**Disclaimer**

This handbook is produced by the Daniel J. Epstein Department of Industrial and Systems Engineering (ISE) as an unofficial guide to graduate studies in the department. The source for much of the information in this booklet is the *USC Catalogue*, the document of authority for all students at the University of Southern California (USC). Degree requirements listed in the *USC Catalogue* supersede any information which may be contained in any bulletin of any school or department. The *USC Catalogue* is updated and published annually by the University of Southern California.

Although the University of Southern California, the Viterbi School of Engineering, and the Daniel J. Epstein Department of Industrial and Systems Engineering have many resources to help each student achieve his/her desired education and training goals, it is ultimately the student's responsibility to see that all requirements for graduation are satisfied.

"Students are expected to be familiar with university policies and to monitor their own academic progress. They should keep all records of official grades earned, degree requirements met, transfer credits accepted, and actions taken on requests for substitutions or exceptions to university policies and regulations." -- USC Catalog

For additional information on USC or the Daniel J. Epstein Department of Industrial and Systems Engineering, go to <https://ise.usc.edu/>

## **DANIEL J. EPSTEIN DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING**

In today's economy, successful graduates need to be skilled in technology, computing and business. To obtain these skills, there is no better major than ISE, and there is no better place to study Industrial and Systems Engineering than at the University of Southern California.

USC graduates:

- Design and implement information systems to control supply chains, production equipment and business operations.
- Lead development projects for computers, software, communication equipment and biotech devices
- Manage technology workers in design firms, manufacturers, and service organizations, such as hospitals and airlines.
- Create human/computer interfaces and invent technology to meet human needs.

A graduate degree from USC's ISE Department enables students to enter careers in technology management, information systems, consulting, automation and optimization.

### **Why USC**

Students come to USC because of our academics and innovative programs, but we also offer:

- Outstanding, well-paid career opportunities in California's high-tech economy.
- Personal contact with top-ranked faculty, who are both world-renowned researchers and experienced engineers.
- A modern and challenging curriculum emphasizing information technology.
- Top students who are attracted to Los Angeles' international economy from around the world.
- A range of degree and course options at the graduate level, with choices for students coming from any engineering or technical major.

Students also select USC because of its leadership in ISE research. Our faculty works with the National Science Foundation, the Integrated Media Systems Center (based at USC) and private companies, to stay at the forefront of innovation in software, control systems and engineering management.

USC's research leadership is reflected in our faculty's membership in the prestigious National Academy of Engineering, publications in leading journals and patents for innovative computer-based technologies.

## **GRADUATE DEGREES OFFERED**

**Master of Science in Analytics** is a program designed to satisfy the growing demand for professionals equipped with significant training in the fundamentals of analytics for solving engineering and management problems in today's data-driven world. Analytics is a multidisciplinary field that applies data analysis to engineering management and enterprise processes.

**Master of Science in Engineering Management** is a program that prepares students to lead technology projects and manage technology-driven organizations and companies delivering a wide array of goods and services. The degree is especially well suited for students who have several years of work experience and are preparing to move into engineering management.

**Master of Science in Health Systems Management Engineering** is for students who are interested in operations management and healthcare applications, and whose career objectives lead to increasing technical management responsibilities in large healthcare organizations, particularly hospitals.

**Master of Science in Industrial and Systems Engineering** prepares students to become technical leaders in industrial engineering by using qualitative and quantitative techniques to improve systems. The ISE program prepares students to become skilled experts, managers, decision makers and researchers for design and optimization in complex and uncertain environments. The ISE Department's research and education benefit society through novel systems for healthcare, manufacturing, transportation and logistics, security, e-commerce, and the environment.

**Master of Science in Operations Research Engineering** trains students in solving business problems with computers and mathematics. This program prepares students to build mathematical models and algorithms to make decisions.

**Master of Science in Product Development Engineering** is a joint program with the Aerospace and Mechanical Engineering Department that prepares engineers to become leaders in engineering design and new product development. Students will choose either the Management Specialization or Technology Specialization.

### **Doctor of Philosophy (Ph.D.)**

The Ph.D. program prepares students for leadership in Industrial and Systems Engineering research and university-level education. In addition to meeting course requirements, students spend one or more years on Ph.D. dissertation research. Policies for the Ph.D. are described in a separate publication available from the department.

Ph.D. applications are individually reviewed by faculty, who consider academic preparation, grade point average, test scores, work experience, statements of purpose and letters of recommendation. Applicants must generally meet the minimum standards, though satisfaction of these standards does not guarantee admission. However, conditional admission is sometimes granted when students are deficient in one area but compensate in others. Therefore, students are still encouraged to apply if some, but not all, qualifications are satisfied.

For more information, please go to <https://gradadm.usc.edu/our-programs/viterbi-school-of-engineering/>

### **FINANCIAL AID**

Financial assistance is administered on various levels at USC:

**University Level** (via The Graduate School). The Graduate School publishes the *Resources for Graduate Students*. Fellowships are available. The completed Graduate Fellowship Application Form should be returned to the Department for processing. The Graduate School also accepts department nominations for scholarships.

**School Level** (via the Viterbi School of Engineering). The Dean and the Director of Graduate Studies of the School of Engineering review information from University Admissions to make awards to qualified candidates.

Graduate School aid and Viterbi School of Engineering aid are primarily awarded to U.S. citizens. Applicants interested in financial assistance should have qualifications well beyond the minimum requirements for admission.

## **ACADEMIC POLICIES**

### **Advisement**

All graduate students in the ISE Department are expected to meet with their advisors at least once per semester to review course plans and to ensure satisfactory degree progress.

### **Course Requirements**

All students should refer to the USC Catalog for their course requirements. Please make sure you are looking at the Catalog for the year you were admitted to the program. Past catalog years may have different requirements which do not apply to your catalog year.

### **Condition of Admission**

Students should successfully complete their conditions of admission as soon as possible in their course of study to prevent registration holds and progress delays.

### **Transfer Credit**

Graduate transfer credit will only be allowed for courses (1) from an accredited graduate school, (2) of a quality of at least 3.0 on a 4.0 grading scale, (3) constituting a reasonable equivalent to current USC course work and logically fitting into the program for the degree.

- Courses used toward a degree completed elsewhere may not be applied toward a master's degree at USC. If courses were not used toward a completed degree, the maximum number of transfer credits that may be applied towards a 28-unit master's degree, subject to departmental approval, is 4 units. Students should arrange for any transfer of credits during the first semester of enrollment at USC.

### **Limited Status Enrollment**

A maximum of 12 units of courses taken as a Limited Status Student may be applied to a degree.

### **Time Limit**

No coursework that is older than seven years may be applied toward a master's degree. The master's degree must be completed within five years of taking the first course applied to the program.

### **Residency**

Students must complete a minimum of 20 units at USC. The last four units of courses must be taken at USC.

### **Grade Point Average Requirement**

Students must maintain an overall 3.0 GPA on 400-level and above work attempted at USC beyond the bachelor's degree to graduate. A minimum grade of C (2.0) is required in a course to receive graduate credit. Transfer units count as credit (CR) and are not calculated in the GPA.

**Graduation**

Students should submit an application to graduate in the myViterbi portal. (The department will email the instructions each semester.) This will alert the the department that you are initiating the degree check process, verifying that all academic and administrative requirements are met.

**Leave of Absence**

A student who must suspend his/her studies for a semester or more must file for a leave of absence with the ISE Department. Students should contact their advisor and withdraw from classes before the last day to drop classes without a mark of W (published in the Schedule of Classes). Students who miss the deadline for a leave of absence may still withdraw from classes with a mark of W but must apply for readmission to the program.

**ACADEMIC HONORS****Academic Awards**

The Department and the Viterbi School of Engineering may, from time to time, nominate students for awards and scholarships. If you feel you may qualify for any award or recognition based on academic performance, leadership, extracurricular activities, or any combination of the above, please let the department know. We are always happy to give students the recognition they deserve.



## **STUDENT ORGANIZATIONS**

To build character and leadership skills, and to acknowledge academic achievement, the ISE Department supports the activities of student organizations which are run by ISE students to further academic and professional goals. Each organization has an ISE faculty or staff member as an advisor. The quality of each of these organizations is directly affected by the quality of its student members, and particularly its officers. Your active participation is, therefore, encouraged.

### **Student Chapter of the Institute of Industrial Engineers**

The Institute of Industrial Engineers is a professional organization for industrial engineers. Its mission is to promote and foster industrial engineering as a profession. Reduced membership dues are available to student members.

### **Alpha Pi Mu**

Alpha Pi Mu is an industrial engineering honors society. Its purpose is to recognize high academic achievement by juniors, seniors, and graduate students in industrial engineering. Membership is by invitation only.

### **Engineering Management Student Association EMSA**

EMSA was established in 2012 to increase the interaction between industry, alumni, students, and professors. The organization is free to all USC students.

### **Omega Rho**

Omega Rho is the operations research honors society. Its purpose is to recognize high academic achievement by undergraduate and graduate students in operations research. Membership is by invitation only.

### **INFORMS**

The INFORMS USC Student Chapter is a graduate student-run organization located at the department of Industrial and Systems Engineering. Our goal is to provide the operations research and management science community at USC support through regular events, including student presentations, journal clubs, distinguished speakers, and coffee hours. Please contact us if you're interested in giving a talk, developing a workshop or joining our chapter.

### **Industrial and Systems Engineering Analytics Student Association (IASA)**

IASA is a student organization created for USC's Analytics program. IASA promotes connection, growth, and collaboration among students, alumni, and faculty through a variety of academic and professional development events. Membership is limited to students in the Analytics program.

## **MS ANALYTICS DEGREE REQUIREMENTS**

### **Foundation Courses (12 units)**

- ISE 521 Foundations of Analytics Units: 4
- ISE 529 Predictive Analytics Units: 4
- ISE 530 Optimization Methods for Analytics Units: 4

### **Project-Based Courses (4 units)**

Select one course.

- ISE 503 Health Analytics Units: 4\*
- ISE 534 Data Analytics Consulting Units: 4
- ISE 543 Enterprise Cloud Analytics Units: 4 \*
- ISE 558 Fundamentals of Data Engineering Units: 4\*

### **Methodology-Based Courses (8 units)**

Select two courses

- ISE 503 Health Analytics Units: 4\*
- ISE 525 Design of Experiments Units: 4
- ISE 535 Data Mining Units: 4
- ISE 537 Financial Analytics Units: 4
- ISE 538 Markov Models for Performance Analysis Units: 4
- ISE 540 Text Analytics Units: 4
- ISE 543 Enterprise Cloud Analytics Units: 4\*
- ISE 547 Applied Generative Artificial Intelligence for Enterprises Units: 4
- ISE 558 Fundamentals of Data Engineering Units: 4\*
- ISE 562 Decision Analysis Units: 4
- ISE 580 Performance Analysis with Simulation Units: 4

\*May count as project course or methodology course, but not both.

### **Advisor-approved Electives (4 units)**

**Total units: 28**

## **MS ENGINEERING MANAGEMENT DEGREE REQUIREMENTS**

### **Required Courses**

ISE 515 Engineering Project Management Units: 4

ISE 519 Engineering Management of Systems Integration Units: 4

ISE 544 Leading and Managing Engineering Teams Units: 4

ISE 561 Economic Analysis of Engineering Projects Units: 4

### **Technology Course**

Select one:

ISE 501 Innovative Conceptual Design for New Product Development Units: 4

ISE 545 Principles and Practices of Global Innovation Units: 4

ISE 585 Strategic Management of Technology and Innovation Units: 4

ISE 588 Management of Rapid Product Development Units: 4

### **Advisor-Approved electives (8 units)**

**Total units: 28**

## **MS HEALTH SYSTEMS MANAGEMENT ENGINEERING DEGREE**

### **REQUIREMENTS**

#### **Required Courses (12 Units)**

ISE 508 Health Care Operations Improvement Units: 4  
ISE 509 Practicum in Health Care Systems Units: 4  
PM 504 Quality in Health Care Units: 4

#### **Health Systems electives (12 units)**

ISE 503 Health Analytics Units: 4  
ISE 504 Management of Change in Health Care Systems Units: 4  
ISE 505 Modeling for Health Policy and Medical Decision Making Units: 4  
ISE 506 Lean Operations Units: 4  
ISE 515 Engineering Project Management Units: 4  
ISE 544 Leading and Managing Engineering Teams Units: 4  
ISE 561 Economic Analysis of Engineering Projects Units: 4  
ISE 564 Organizational Performance Analysis Units: 4  
ISE 570 Human Factors in Engineering Units: 4  
ISE 580 Performance Analysis with Simulation Units: 4  
PM 508 Health Service Delivery in the U.S. Units: 4

#### **Advisor-Approved Electives (4 Units)**

**Total Units: 28**

## **MS INDUSTRIAL AND SYSTEMS ENGINEERING DEGREE REQUIREMENTS**

### **Required Courses (12 units)**

- ISE 513 Logistics and Inventory Systems Units: 4
- ISE 514 Advanced Production Planning and Scheduling Units: 4
- ISE 515 Engineering Project Management Units: 4

### **Group A Quantitative Techniques (4 units required)**

Select one course

- ISE 530 Optimization Methods for Analytics Units: 4
- ISE 536 Linear Programming and Extensions Units: 4
- ISE 538 Markov Models for Performance Analysis Units: 4
- ISE 580 Performance Analysis with Simulation Units: 4
- ISE 539 Stochastic Elements of Simulation Units: 4

### **Group B Quality and Operations (4 units required)**

Select one course

- ISE 506 Lean Operations Units: 4
- ISE 525 Design of Experiments Units: 4
- ISE 527 Quality Management for Engineers Units: 4
- ISE 583 Enterprise Wide Information Systems Units: 4

### **Group C Engineering Management (4 units required)**

Select one course

- ISE 561 Economic Analysis of Engineering Projects Units: 4
- ISE 562 Decision Analysis Units: 4
- ISE 564 Organizational Performance Analysis Units: 4
- ISE 570 Human Factors in Engineering Units: 4

### **Advisor approved electives (4 units)**

**Total Units 28**

## **MS OPERATIONS RESEARCH ENGINEERING DEGREE REQUIREMENTS**

### **Required Courses: 20 units**

- ISE 536 Linear Programming and Extensions Units: 4
- ISE 538 Markov Models for Performance Analysis Units: 4
- ISE 580 Performance Analysis with Simulation Units: 4
- ISE 583 Enterprise Wide Information Systems Units: 4
- ISE 632 Network Flows and Combinatorial Optimization Units: 4

### **Select one from the following: 4 units**

- ISE 513 Logistics and Inventory Systems Units: 4
- ISE 514 Advanced Production Planning and Scheduling Units: 4
- ISE 520 Optimization Theory and Algorithms: Numerical Optimization Units: 4
- ISE 525 Design of Experiments Units: 4
- ISE 539 Stochastic Elements of Simulation Units: 4
- ISE 562 Decision Analysis Units: 4
- ISE 563 Financial Engineering Units: 4
- ISE 576 Industrial Ecology Units: 4

### **Advisor-Approved Elective: 4 units**

**Total units: 28**

## **MS PRODUCT DEVELOPMENT ENGINEERING DEGREE REQUIREMENTS**

### **Core courses for both Management and Technology Specializations (8 units)**

ISE 545 Principles and Practices of Global Innovation Units: 4

ISE 501 Innovative Conceptual Design for New Product Development Units: 4

### **Management Specialization Required Courses (8 units)**

ISE 515 Engineering Project Management Units: 4

ISE 544 Leading and Managing Engineering Teams Units: 4 **OR**

ISE 585 Strategic Management of Technology and Innovation Units: 4 **OR**

ISE 588 Management of Rapid Product Development Units: 4

### **Management Specialization Technical Electives (8 units)**

Select two courses from the list

AME 504 Mechatronics Systems Engineering Units: 4

AME 510 Advanced Computational Design and Manufacturing Units: 4

ISE 514 Advanced Production Planning and Scheduling Units: 4

ISE 519 Engineering Management of Systems Integration Units: 4

ISE 525 Design of Experiments Units: 4

ISE 527 Quality Management for Engineers Units: 4

ISE 544 Leading and Managing Engineering Teams Units: 4\*

ISE 561 Economic Analysis of Engineering Projects Units: 4

ISE 562 Decision Analysis Units: 4

ISE 580 Performance Analysis with Simulation Units: 4

ISE 583 Enterprise Wide Information Systems Units: 4

ISE 585 Strategic Management of Technology and Innovation Units: 4\*

ISE 588 Management of Rapid Product Development Units: 4\*

ISE 610 Advanced Design of Experiments and Quality Engineering Units: 4

\*May be used as a specialization required course or a technical elective course, but not both.

### **Management Specialization General Electives Suggested (4 units)**

Advisor-approved electives must be upper-division 400- or 500-level courses. Up to 4 units can be transferred from other institutions.

CSCI 567 Machine Learning Units: 4

DSCI 552 Machine Learning for Data Science Units: 4

ISE 460 Engineering Decisions, Economics and Ethics Units: 4

ISE 470 Human/Computer Interface Design Units: 4

ISE 506 Lean Operations Units: 4

ISE 529 Predictive Analytics Units: 4

ISE 530 Optimization Methods for Analytics Units: 4

ISE 633 Large Scale Optimization and Machine Learning Units: 4

PPD 587 Risk Analysis Units: 4

**Technology Specialization Required Courses (7-8 units) AME**

503 Advanced Mechanical Design Units: 3

AME 525 Linear Algebra in Engineering Science Units: 4 **OR**

AME 526 Partial Differential Equations for Engineering Applications Units: 4 **OR**

AME 540 Probability and Statistics in Engineering Science Units: 4

**Technology Specialization Technical Electives (6-8 units)**

AME 408 Computer-Aided Design of Mechanical Systems Units: 3

AME 410 Engineering Design Theory and Methodology Units: 3

AME 502 Modern Topics in Aerospace Design Units: 3

AME 505 Engineering Information Modeling Units: 3

AME 510 Advanced Computational Design and Manufacturing Units: 4

AME 525 Engineering Analysis Units: 4 \*

AME 526 Introduction to Mathematical Methods in Engineering II Units: 4 \*

AME 527 Elements of Vehicle and Energy Systems Design Units: 3

AME 544 Computer Control of Mechanical Systems Units: 3

AME 546 Design for Manufacturing Assembly Units: 4

AME 547 Foundations for Manufacturing Automation Units: 4

ASTE 523 Design of Low Cost Space Missions Units: 3

CE 576 Invention and Technology Development Units: 3

ISE 567 Collaborative Engineering Principles and Practice Units: 3

ISE 576 Industrial Ecology Units: 4

ISE 585 Strategic Management of Technology and Innovation Units: 4

MASC 551 Mechanical Behavior of Engineering Materials Units: 4

MASC 583 Materials Selection Units: 4

SAE 549 Systems Architecting Units: 3

\*Choose one that is not included as a specialization required course.

**Technology Specialization General Electives Suggested (4-7 units)**

Advisor-approved electives must be upper-division 400- or 500-level courses. Up to 4 units can be transferred from other institutions.

AME 481 Aircraft Design Units: 4

AME 577 Survey of Energy and Power for a Sustainable Future Units: 4 ASTE

520 Spacecraft System Design Units: 3

CE 529 Finite Element Analysis Units: 4

CE 543 Structural Instability and Failure Units: 4

**Total Units: 28**



# NON-ISE ADVISOR APPROVED ELECTIVES AND PROGRAMS FOR WHICH THEY ARE APPROVED

|                                                                                 | NLTx | EMT | HSME | ISE | ORE | PDE |
|---------------------------------------------------------------------------------|------|-----|------|-----|-----|-----|
| <b>AME</b>                                                                      |      |     |      |     |     |     |
| AME 403 Stress Analysis                                                         |      |     |      |     |     | PDE |
| AME 408 Computer-Aided Design of Mechanical Systems                             |      |     |      |     |     | PDE |
| AME 451 Linear Control Systems I                                                |      |     |      |     |     | PDE |
| AME 481 Aircraft Design                                                         |      |     |      |     |     | PDE |
| AME 501 Spacecraft System Design                                                |      |     |      |     |     | PDE |
| AME 503 Advanced Mechanical Design                                              |      |     |      |     |     | PDE |
| AME 504 Mechatronics Systems Engineering                                        |      |     |      |     |     | PDE |
| AME 510 Advanced Computational Design and Manufacturing                         |      |     |      |     |     | PDE |
| AME 528 Finite Element Analysis                                                 |      |     |      |     |     | PDE |
| AME 529 Aircraft Structures Analysis                                            |      |     |      |     |     | PDE |
| AME 541 Linear Control Systems II                                               |      |     |      |     |     | PDE |
| AME 546 Design for Manufacturing Assembly                                       |      |     |      |     |     | PDE |
| AME 552 Nonlinear Control Systems                                               |      |     |      |     |     | PDE |
| AME 554 Additive Manufacturing Technologies                                     |      |     |      |     |     | PDE |
| AME 556 Robot Dynamics and Control                                              |      |     |      |     | ORE |     |
| AME 563 Computational Design of Machine Components                              |      |     |      |     |     | PDE |
| AME 577 Survey of Energy and Power for a Sustainable Future                     |      |     |      |     |     | PDE |
| <b>ASTE</b>                                                                     |      |     |      |     |     |     |
| ASTE 520 Spacecraft System Design                                               |      |     |      |     |     | PDE |
| <b>BME</b>                                                                      |      |     |      |     |     |     |
| BME 527 Integration of Medical Imaging Systems                                  |      |     | HSME |     |     |     |
| BME 528 Medical Diagnostics, Therapeutics and Informatics Applications          |      |     | HSME |     |     |     |
| <b>BAEP</b>                                                                     |      |     |      |     |     |     |
| BAEP 450 Fundamentals of Entrepreneurship                                       |      | EMT |      |     |     |     |
| BAEP 476 Green Entrepreneurship                                                 |      | EMT |      |     |     |     |
| BAEP 553 Cases in New Venture Management                                        |      | EMT |      | ISE |     |     |
| BAEP 551 Introduction to New Ventures                                           |      | EMT |      |     |     | PDE |
| BAEP 554 Venture Initiation                                                     |      | EMT |      |     |     | PDE |
| BAEP 555 Founders Dilemmas: Anticipate and Avoid Startup Pitfalls               |      | EMT |      |     |     | PDE |
| BAEP 556 Technology Feasibility                                                 |      | EMT |      |     |     | PDE |
| BAEP 557 Technology Commercialization                                           |      | EMT |      | ISE |     | PDE |
| BAEP 558 The Entrepreneurial Advisor: Problem Solving for Early-Stage Companies |      | EMT |      |     |     |     |
| BAEP 559 Investing in New Ventures                                              |      | EMT |      |     |     |     |
| BAEP 562 Entrepreneurship in eCommerce                                          |      | EMT |      |     |     |     |
| BAEP 563 Corporate Entrepreneurship                                             |      | EMT |      |     |     |     |
| BAEP 565 Digital Playbook for Entrepreneurs: Creating a Tech Startup            |      | EMT |      |     |     |     |
| BAEP 572 Performance Mindset for Business                                       |      | EMT |      |     |     |     |
| BAEP 577 The Entrepreneurial CEO: The Real World of Leading Startups            |      | EMT |      |     |     |     |
| <b>CE</b>                                                                       |      |     |      |     |     |     |
| CE 404 Business and Intellectual Property Law for Engineers                     |      |     |      | ISE |     |     |
| CE 412 Construction Contracts and Law                                           |      |     |      | ISE |     |     |
| CE 460 Construction Engineering                                                 |      |     |      | ISE |     |     |
| CE 461 Construction Estimating                                                  |      |     |      | ISE |     |     |
| CE 462 Construction Methods and Equipment                                       |      |     |      | ISE |     |     |
| CE 469 Sustainable Design and Construction                                      |      | EMT |      |     |     |     |
| CE 471 Principles of Transportation Engineering                                 |      |     |      | ISE |     |     |
| CE 501 Construction Practices                                                   |      | EMT |      | ISE |     |     |
| CE 502 Construction Accounting, Finance and Strategy                            |      | EMT |      | ISE |     |     |
| CE 506 Heavy Construction Estimating                                            |      |     |      | ISE |     |     |
| CE 513 Game Theory for Interactive Autonomy                                     | NLTx | EMT | HSME | ISE | ORE | PDE |
| CE 550 Computer-Aided Engineering                                               |      |     |      | ISE |     | PDE |
| CE 551 Computer-Aided Engineering Project                                       |      |     |      | ISE |     | PDE |
| CE 552 Managing and Financing Public Engineering Works                          |      |     |      | ISE |     |     |
| CE 554 Risk and Reliability Analysis for Civil Infrastructure Systems           |      |     |      | ISE |     |     |
| CE 558 International Construction and Engineering                               |      |     |      | ISE |     |     |
| CE 576 Invention and Technology Development                                     |      | EMT |      |     |     |     |
| CE 579 Introduction to Transportation Planning Law                              |      |     |      | ISE |     |     |

|                                                                                                                                                                                     |      |     |      |     |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|------|-----|-----|-----|
| CE 585 Traffic Engineering and Control                                                                                                                                              |      |     |      | ISE |     |     |
| CE 589 Port Engineering: Planning and Operational Analysis                                                                                                                          |      | EMT |      | ISE |     |     |
| CE 633 Urban Transportation Planning and Management                                                                                                                                 |      |     |      | ISE |     |     |
| CE 634 Institutional and Policy Issues in Transportation                                                                                                                            |      |     |      | ISE |     |     |
| <b>CSCI</b>                                                                                                                                                                         |      |     |      |     |     |     |
| <i>Students interested in taking courses in Computer Science (CSCI) must make an appointment with their assigned ISE academic advisor via Advise USC to inquire about approval.</i> |      |     |      |     |     |     |
| <b>DSCI</b>                                                                                                                                                                         |      |     |      |     |     |     |
| DSCI 510 Principles of Programming for Data Science                                                                                                                                 | NLTX | EMT |      | ISE | ORE | PDE |
| DSCI 519 Foundations & Policy for Information Security                                                                                                                              | NLTX |     |      |     |     |     |
| DSCI 549 Introduction to Computational Thinking and Data Science                                                                                                                    |      |     |      | ISE |     |     |
| DSCI 551 Foundations of Data Management                                                                                                                                             | NLTX |     |      |     |     |     |
| DSCI 552 Machine Learning for Data Science                                                                                                                                          | NLTX | EMT |      |     |     |     |
| DSCI 553 Foundations & Applications of Data Mining                                                                                                                                  | NLTX |     |      |     |     |     |
| DSCI 554 Data Visualization                                                                                                                                                         | NLTX |     |      |     |     |     |
| <b>DSO</b>                                                                                                                                                                          |      |     |      |     |     |     |
| DSO 427 Spreadsheet Modeling for Business Insights                                                                                                                                  |      |     |      | ISE |     |     |
| DSO 431 Digital Innovation as Competitive Advantage                                                                                                                                 |      |     |      | ISE |     |     |
| DSO 433 Designing Digital Processes and User Experiences                                                                                                                            |      |     |      | ISE |     |     |
| DSO 482 Supply Chain Management                                                                                                                                                     |      | EMT |      | ISE |     |     |
| DSO 505 Sustainable Supply Chains                                                                                                                                                   |      | EMT |      |     |     |     |
| DSO 506 Sourcing and Supplier Management                                                                                                                                            |      | EMT | HSME | ISE |     |     |
| DSO 510 Business Analytics Units                                                                                                                                                    |      | EMT |      |     |     |     |
| DSO 516 Probability and Data Modeling                                                                                                                                               |      | EMT |      | ISE |     |     |
| DSO 520 Logistics Management                                                                                                                                                        |      | EMT |      |     |     |     |
| DSO 522 Applied Time Series Analysis for Forecasting                                                                                                                                |      | EMT |      |     |     |     |
| DSO 528 Blended Data Business Analytics for Efficient Decisions                                                                                                                     | NLTX | EMT |      | ISE |     |     |
| DSO 529 Advanced Regression Analysis                                                                                                                                                |      | EMT |      |     |     |     |
| DSO 530 Applied Modern Statistical Learning Methods                                                                                                                                 |      | EMT |      |     |     |     |
| DSO 531 Digital Foundations for Business Innovation                                                                                                                                 | NLTX | EMT |      | ISE |     | PDE |
| DSO 534 Discrete-Event Simulation for Process Management                                                                                                                            |      | EMT |      |     |     |     |
| DSO 536 Business Decision Modeling and Risk Analysis                                                                                                                                |      | EMT |      |     |     |     |
| DSO 545 Statistical Computing and Data Visualization                                                                                                                                | NLTX | EMT |      |     |     |     |
| DSO 547 Spreadsheet Modeling for Business Insights                                                                                                                                  | NLTX | EMT |      | ISE |     |     |
| DSO 548 Emerging Technologies in Supply Chain Management                                                                                                                            |      | EMT |      | ISE |     |     |
| DSO 549 Application of Lean Six Sigma                                                                                                                                               |      | EMT |      |     |     |     |
| DSO 551 Digital Transformation in the Global Enterprise                                                                                                                             |      | EMT |      |     |     | PDE |
| DSO 552 SQL Databases for Business Analysts                                                                                                                                         |      | EMT |      |     |     |     |
| DSO 553 NoSQL Databases in Big Data                                                                                                                                                 |      | EMT |      |     |     |     |
| DSO 554 Digital Strategies for Sustainability in Global Markets                                                                                                                     |      | EMT |      |     |     |     |
| DSO 556 Business Models for Digital Platforms                                                                                                                                       |      | EMT |      | ISE |     |     |
| DSO 559 Introduction to Python for Business Analytics                                                                                                                               |      | EMT |      |     |     |     |
| DSO 562 Fraud Analytics                                                                                                                                                             | NLTX | EMT |      |     |     |     |
| DSO 565 Supply Chain Analytics                                                                                                                                                      |      | EMT |      | ISE |     |     |
| DSO 567 Data Analytics for the Game Industry                                                                                                                                        |      | EMT |      |     |     |     |
| DSO 569 Deep Learning for Business Applications                                                                                                                                     |      | EMT |      |     |     |     |
| DSO 570 The Analytics Edge: Data, Models, and Effective Decisions                                                                                                                   |      | EMT |      | ISE |     |     |
| DSO 572 Strategies for Digital Analytics                                                                                                                                            |      | EMT |      |     |     |     |
| DSO 573 Data Analytics Driven Dynamic Strategy and Execution                                                                                                                        |      | EMT |      |     |     |     |
| DSO 574 Using Big Data: Challenges and Opportunities                                                                                                                                |      | EMT |      |     |     |     |
| DSO 575 Driving Business Transformation with GenAI and ML                                                                                                                           |      | EMT |      |     |     |     |
| DSO 578 Fundamentals of Sports Performance Analytics                                                                                                                                | NLTX | EMT |      |     |     |     |
| DSO 579 Advanced Sports Performance Analytics                                                                                                                                       | NLTX | EMT |      |     |     |     |
| DSO 581 Supply Chain Management                                                                                                                                                     |      | EMT | HSME | ISE |     | PDE |
| DSO 582 Service Management: Economics and Operations                                                                                                                                |      | EMT |      |     |     |     |
| DSO 583 Operations Consulting                                                                                                                                                       |      | EMT |      | ISE |     |     |
| DSO 584 Global Operations Management                                                                                                                                                |      | EMT |      |     |     |     |
| <b>EE</b>                                                                                                                                                                           |      |     |      |     |     |     |
| EE 682 Law, AI, and Intellectual Property for Engineers                                                                                                                             | NLTX | EMT | HSME | ISE | ORE | PDE |

|                                                                                |      |     |      |     |  |     |
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| <b>ENE</b>                                                                     |      |     |      |     |  |     |
| ENE 502 Environmental and Regulatory Compliance                                |      | EMT |      |     |  |     |
| ENE 505 Energy and the Environment                                             |      |     |      | ISE |  |     |
| ENE 506 Ecology for Environmental Engineers                                    |      |     |      | ISE |  |     |
| ENE 510 Water Quality Management and Practice                                  |      |     |      | ISE |  |     |
| <b>FBE</b>                                                                     |      |     |      |     |  |     |
| FBE 527 Entrepreneurial Finance: Financial Management for Developing Firms     |      | EMT |      | ISE |  | PDE |
| FBE 529: Financial Analysis and Valuation                                      |      |     |      | ISE |  |     |
| FBE 559: Management of Financial Risk                                          |      |     |      | ISE |  |     |
| <b>GSBA</b>                                                                    |      |     |      |     |  |     |
| GSBA 504a Operations Management                                                |      | EMT |      |     |  |     |
| GSBA 504b Operations Management                                                |      | EMT |      |     |  |     |
| GSBA 506a Applied Managerial Statistics                                        |      | EMT |      |     |  |     |
| GSBA 506b Applied Managerial Statistics                                        |      | EMT |      |     |  |     |
| GSBA 520 Business Fundamentals for Non-Business Professionals                  |      |     |      | ISE |  |     |
| GSBA 545 Data Driven Decision Making                                           |      | EMT |      |     |  | PDE |
| GSBA 524 Data Science for Business                                             |      | EMT |      |     |  |     |
| GSBA 534 Operations Management                                                 |      | EMT |      | ISE |  |     |
| GSBA 548 Corporate Finance                                                     | NLTX | EMT |      |     |  | PDE |
| GSBA 551 Entrepreneurship and Innovation                                       |      | EMT |      |     |  |     |
| GSBA 561 Evaluating Market Performance                                         | NLTX |     |      |     |  |     |
| GSBA 562 Management of Operations                                              | NLTX |     |      |     |  |     |
| GSBA 563 Technology and Information Systems Management                         | NLTX |     |      |     |  |     |
| <b>MASC</b>                                                                    |      |     |      |     |  |     |
| MASC 472 Polymer Science and Engineering                                       |      |     |      |     |  | PDE |
| MASC 475 Physical Properties of Polymers                                       |      |     |      |     |  | PDE |
| MASC 511 Materials Preparation                                                 |      |     |      |     |  | PDE |
| MASC 513 Multilayered Materials & Properties                                   |      |     |      |     |  | PDE |
| MASC 518 Semiconductor Materials for Devices                                   |      |     |      |     |  | PDE |
| MASC 560 Fatigue and Fracture                                                  |      |     |      |     |  | PDE |
| MASC 583 Materials Selection                                                   |      |     |      |     |  | PDE |
| MASC 584 Fracture Mechanics and Mechanisms                                     |      |     |      |     |  | PDE |
| <b>MKT</b>                                                                     |      |     |      |     |  |     |
| MKT 512 Customer Insights and Analysis                                         |      | EMT |      | ISE |  |     |
| MKT 530 New Product Development                                                | NLTX | EMT |      |     |  |     |
| MKT 551 From Strategy to Execution: User Experience (UX) and Design Units      |      | EMT |      |     |  |     |
| <b>MOR</b>                                                                     |      |     |      |     |  |     |
| MOR 458 AI Technology strategic management                                     |      | EMT |      |     |  |     |
| MOR 462: Management Consulting                                                 |      | EMT |      | ISE |  | PDE |
| MOR 530 Strategic Leadership in Product Management                             |      | EMT |      |     |  |     |
| MOR 531 Applied Product Management                                             |      | EMT |      |     |  |     |
| MOR 542 Strategic Issues for Global Business                                   |      | EMT |      |     |  |     |
| MOR 544 Fundamentals of Crisis Management                                      |      | EMT |      |     |  |     |
| MOR 555 Designing High Performance Organizations                               |      | EMT |      | ISE |  |     |
| MOR 557 Strategy and Organization Consulting                                   |      | EMT |      | ISE |  |     |
| MOR 559 Strategic Renewal and Transformation                                   |      | EMT |      |     |  |     |
| MOR 560 Managerial Judgement and Decision Making                               |      | EMT |      |     |  | PDE |
| MOR-561 Strategies in High-Tech Businesses                                     |      | EMT |      |     |  |     |
| MOR 562 Strategic Choice and Valuation Analysis                                |      | EMT |      | ISE |  |     |
| MOR-564 Strategic Innovation: Creating New Markets, Business Models and Growth |      | EMT |      | ISE |  |     |
| MOR 565 Alliances and Cooperative Strategy                                     |      | EMT |      |     |  | PDE |
| MOR 566 Environmental Sustainability and Competitive Advantage                 |      | EMT |      | ISE |  |     |
| MOR 569 Negotiation and Deal-Making                                            | NLTX | EMT |      |     |  | PDE |
| MOR 588 Corporate Strategy and Competitive Dynamics                            |      | EMT |      |     |  |     |
| <b>PM</b>                                                                      |      |     |      |     |  |     |
| PM 500 Foundations of Health Behavior                                          |      |     | HSME |     |  |     |
| PM 502 Foundations of Public Health                                            |      |     | HSME |     |  |     |
| PM 519 Health Disparities in the U.S.                                          |      |     | HSME |     |  |     |
| PM 526 Communications in Public Health                                         |      |     | HSME |     |  |     |
| PM 547 Public Health Policy and Politics                                       |      |     | HSME |     |  |     |

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| <b>PPD</b>                                                         |      |     |      |     |     |     |
| PPD 501ab Economics for Policy, Planning and Development           |      |     |      | ISE |     |     |
| PPD 506 Introduction to Microeconomics Applications in Health      |      |     | HSME |     |     |     |
| PPD 509 Problems and Issues in the Health Field                    |      |     | HSME | ISE |     |     |
| PPD 510ab Financial Management of Health Services                  |      |     |      | ISE |     |     |
| PPD 511 Health Information Systems                                 |      |     |      | ISE |     |     |
| PPD 513 Legal Issues in Health Care Delivery                       |      |     |      | ISE |     |     |
| PPD 514 Economic Concepts Applied to Health                        |      |     |      | ISE |     |     |
| PPD 516 Financial Accounting for Health Care Organizations         |      |     | HSME | ISE |     |     |
| PPD 518 Quality of Care Concepts                                   |      |     | HSME |     |     |     |
| PPD 558 Multivariate Statistical Analysis                          |      |     |      | ISE |     |     |
| PPD 587 Risk Analysis (crosslisted as ISE 587)                     |      | EMT |      | ISE |     | PDE |
| PPD 634 Institutional and Policy Issues in Transportation          |      |     |      | ISE |     |     |
| <b>PPDE</b>                                                        |      |     |      |     |     |     |
| PPDE 612 Consulting in Healthcare Organizations                    |      |     | HSME |     |     |     |
| <b>SAE</b>                                                         |      |     |      |     |     |     |
| SAE 541 Systems Engineering Theory and Practice                    | NLTX | EMT | HSME | ISE | ORE | PDE |
| SAE 546 Engineering Resilient Systems and System-of Systems        |      |     |      |     |     | PDE |
| SAE 547 Model Based Systems Architecting and Engineering           |      | EMT |      |     |     | PDE |
| SAE 548 System/System-of-Systems Integration and Communication     | NLTX | EMT |      |     |     |     |
| SAE 549 Systems Architecting                                       |      | EMT |      | ISE |     | PDE |
| SAE 550 Systems Architecting and the Political Process             |      | EMT |      |     |     | PDE |
| SAE 574 Net-Centric Systems Architecting and Engineering           |      |     |      | ISE |     |     |
| <b>TAC</b>                                                         |      |     |      |     |     |     |
| TAC 404 Advanced Front-End Web Development                         |      |     |      | ISE |     |     |
| TAC 422 Configuring Enterprise Resource Planning Systems           |      |     |      | ISE |     |     |
| TAC 454x Enterprise Resource Planning, Design, and Implementation  |      |     |      | ISE |     |     |
| TAC 457 Network Security                                           |      |     |      | ISE |     |     |
| TAC 460 Web Application Project                                    |      |     |      | ISE |     |     |
| TAC 466 Building the High-Tech Startup                             |      | EMT |      |     |     |     |
| TAC 486 Securing and Auditing Enterprise Resource Planning Systems |      |     |      | ISE |     |     |
| TAC 487 Enterprise Data Analytics                                  |      |     |      | ISE |     |     |