



# Architecture-based Enterprise Systems Engineering Leadership Program

Graduate Education for Engineering Professionals

## Vision

The rapid growth of the Internet and information technology has altered the demands and possibilities for competitive **A**dvantage and enhanced productivity for enterprises, both defense and commercial.

Successful organizations have embraced a holistic, **E**nterprise-wide strategy that facilitates evolutionary change in processes and functions to better respond to the complex and event-driven environments in which they are forced to compete.

The Master of Advanced Study in Architecture-based Enterprise Systems Engineering bridges the gap between engineers and managers, helping engineers gain a better understanding of management essentials coupled with a broadened view of **S**ystems engineering disciplines that enable a more holistic approach to problems of the enterprise.

Program graduates should be well-prepared to assume a leadership role in enabling their organizations to respond innovatively to the challenges of the dynamic, competitive and **E**vent-driven environment.

**DEVELOP A COMPREHENSIVE AND  
BALANCED UNDERSTANDING OF  
COMPLEXITY AND THE TOOLS FOR  
BUILDING EFFECTIVE ENTERPRISE  
SYSTEMS.**

Learn the role of enterprise **A**rchitecting in bridging management and engineering practices to develop effective corporate strategy.

Understand program and project management approaches to dealing with challenges of complex large scale **E**nterprise systems and unexpected complex events.

Apply state-of-practice knowledge spanning enterprise-wide **S**ystems engineering methods and processes for modern, distributed decision support systems.

Gain hands-on experience as an enterprise architect and **E**ngineer in a program-long team-based project.

ENHANCE AND BROADEN LEADERSHIP SKILLS TO ENABLE GREATER CONTRIBUTION TO FUTURE CORPORATE STRATEGY

# Architecture-based Enterprise Systems Engineering Leadership Program

## Master of Advanced Study Degree

### About the Master of Advanced Study

The MAS in Architecture-based Enterprise Systems Engineering is a degree conferred by the University of California, San Diego. Courses are taught by faculty in the Jacobs School of Engineering and Rady School of Management, with guest speakers from other leading universities and industry.

This high quality degree program is designed for engineering professionals. Students are able to continue full-time employment while participating in the program. Classes are held primarily on Fridays and Saturdays from 8 a.m. to 5 p.m., and meet every other week.

### Who Should Apply

The program is intended for senior engineers and engineering managers who want to build leadership and management skills, enhance strategic thinking and decision making through enterprise architecting tools, and improve opportunities for personal career growth.

### How to Apply

Visit [aese.ucsd.edu](http://aese.ucsd.edu) for complete application procedures, deadlines, and fees. Prospective students enter the program in the Fall.

### Faculty Directors



**Hal Sorenson**  
Professor  
Mechanical and  
Aerospace Engineering



**Ingolf Kreuger**  
Associate Professor  
Computer Science  
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Adjunct appointment in  
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### Coursework

The MAS in Architecture-based Enterprise Systems Engineering is a 42-unit degree to be completed in one year of study. Courses are offered over four consecutive quarters, beginning in the Fall. The curriculum consists of 9 courses and a capstone team project, which is conducted throughout the execution of the program.

#### Fall Quarter

##### Essentials for Business Practice: MGT 291

Introduces the essentials of enterprise leadership and management to include strategic thinking, investment planning and finance, business operations, and marketing.

##### Leadership Skills, Values, and Team-building: MGT 406

Provides a learning environment for team-building through understanding self and others, emotional intelligence, and applying influencing techniques to strengthen collaborative efforts in a variety of situations.

##### Complexity and Large-scale Systems: AESE 278A

Discusses system complexity, event complexity, and complex adaptive systems and applies the concepts to enterprise transformation, supply chain management, and the management of complex system development through plan-driven and agile methods.

#### Winter Quarter

##### Enterprise Architecting: AESE 278B

Considers enterprise architecting starting with architectural frameworks and the role of use cases in identifying desired capabilities and requirements. Explores modeling of enterprise architectures through ontologies and domain models. Introduces service-oriented architectures (SOA) and concludes with a discussion of SOA security.

##### Engineering Essentials for Distributed Systems: AESE 278D

Addresses the use of the Unified Modeling Language (UML) for architectural modeling and introduces students to a powerful software modeling tool, Enterprise Architect, with emphasis on SOA modeling. Concludes with a discussion of SOA governance.

##### Modeling, Simulation and Analysis, AESE 278C

Introduces an object-oriented development process within the context of the DOD Architecture Framework and emphasizes model evaluation based on the creation of executable architectures using discrete event dynamic systems and colored Petri nets. Discusses an architectural development management process using measures of effectiveness and measures of performance.

#### Spring Quarter

##### Patterns for Enterprise Architecting: AESE 278E

Presents pattern concepts and their application for enterprise integration and develops various fundamental service patterns for SOA applications. Concludes by introducing event-driven architectures (EDA) and relates EDAs to SOA and uses them to begin the discussion of decision support systems and complex event processing.

##### Decision and Risk Analysis: AESE 241

Explore human decision-making and investment planning. Define the real option investment valuation and compete on analytics while looking at risk and utility theory and multi-attribute utility theory (MAUT).

##### Managing Stakeholder Relationships: AESE 261

Emphasizes building and leveraging business relationships and creating business strategies in the context of successful proposal strategies driven by effective executive strategies

##### Capstone Team Projects: AESE 279

The capstone team project is conducted throughout the execution of the program. At the beginning of the program, 3 to 5 person teams are formed and select a topic to be investigated throughout the rest of the program, preferably in conjunction with industrial partners.