

## **SE 54000 - Systems Architecture**

### **Type of Course**

Elective

### **Catalog Description**

Systems engineering best practices prescribe a set of methodologies for architecting and designing complex systems. This course covers requirements analysis, functional analysis and allocation, and synthesis and their interaction with systems analysis and control functions, including system trades, management of risk, configuration, interfaces and data, and development of performance measures. The lectures are complemented by a class design project to architect a complex system leading to development of a functional and physical architecture and associated functional and allocated baselines.

### **Credits**

3

### **Contact Hours**

3

### **Prerequisite Courses**

None

### **Corequisite Courses**

None

### **Prerequisites by Topics**

Prerequisites: Senior or graduate class standing in an engineering or science degree program, or consent of instructor.

### **Textbook**

None

### **Course Objectives**

Students who successfully complete this course will be able to:

1. Apply the terminology pertaining to architectural descriptions to design (and improve) systems
2. Demonstrate why our tone affects the ability to make system improvements; realize that the origin of at least 90 percent of all issues is due to the system design and implementation and not the people.
3. Use ANSI/IEEE1471-2000 and ISO/IEC/IEEE 42010:2011 architectural descriptions and gain an understanding of the evolution of these standards

4. Understand the possible role(s) and responsibilities of a system architect
5. Apply architecture frameworks to design a product or enterprise as a system
6. Critically evaluate the pros and cons of an architecture framework (facilitated by literature survey).
7. Design and develop a product that is producible
8. Apply the use of an architectural framework in product development

### **Lecture Topics**

1. Department of Defense Technology Acquisition Process
2. Time Value of Money, Interest Formulas / Factors
3. Cost As an Independent Variable (CAIV)
4. Return On Investment (ROI) and Payback
5. Decision Making Among Alternatives
6. Systems Engineering Management Plan (SEMP)
7. Work Breakdown Structure (WBS)
8. Project Budget / Cost Estimate and Chart of Accounts
9. Defense Contract Audit Agency (DCAA) Auditing
10. Overhead Allocation: Traditional vs. Activity Based Cost vs. Lean Accounting
11. Earned Value Management
12. Accounting and Depreciation
13. Financial Statements: Balance Sheet, Income and Cash Flow Statements
14. Enterprise Resource Planning (ERP) Software Specification and Selection
15. Cost and Risk Management using Budget

### **Computer Usage**

None

### **Laboratory Experience**

None

### **Design Experience**

Low

### **Coordinator**

David S. Cochran, Ph.D.

### **Date**

11/16/2022