

Spring Semester 2009

Course: **ETLS 508 Systems Engineering II**

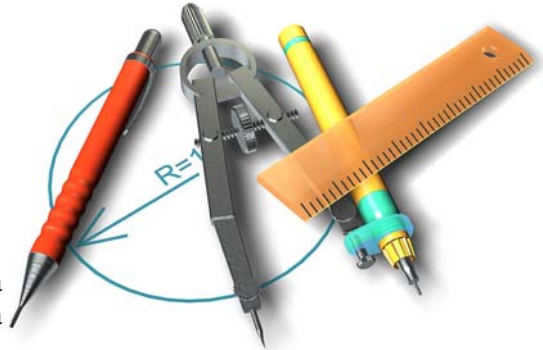
Time: Tuesday 6:00-9:00 pm

Location: St. Paul Campus

Instructors: Tony Beck
(612) 240-0144 (cell)

Assisted by: R.J. Monson

Background: B.S.E.E. University of Minnesota
M.S.E.E. University of Minnesota



Required Texts:

Dorner, Dietrich (1996) *Logic of Failure: Why Things Go Wrong and What We Can Do to Make Them Right*. ISBN #0201479486, Perseus Publishing.

INCOSE Systems Engineering Handbook – reference text

Course Description:

This class considers the engineering of both natural and human-made systems as well as the analysis of those systems. The principal focus of the course will be relating to development of complex systems, focusing on simulation, modeling, and the human factors of systems engineering. In general this will relate to the development of systems which cross multiple domains of expertise. The course will require the students to execute the basic skills of systems engineering by means of a major proposal effort conducted throughout the course duration. This course will be ideal for any student seeking to expand their current project development skills to enable them to effectively execute large and complex programs, or simply to manage their current projects with a systems view perspective.

Course Objectives:

By the end of the course the student should be able to demonstrate a general knowledge of Systems Engineering methodologies and skills, and exhibit a heightened awareness of the challenges facing a Systems Engineer.

Learning Outcomes:

Upon successful completion of the course, the student will be able to:

Outcome	Mechanism
1. Understand Systems Thinking	M,P,C
2. Define and formulate the underlying requirements of a project	M,P,F,C
3. Plan and document a project or program, including a i. Performance Specification ii. Project Schedule iii. Project Budget	M,P,C
4. Understand Systems Simulation and Modeling	M,F,C
5. Understand Enterprise Architecture and DODAF	M,P,F,C
6. Understand Human Factors in Systems Engineering	M,P,F,C
7. Recognizing Failure Modes and Effects	M,P,F,C

Course Methodology:

A mix of lecture, case studies, class discussion, in-class role playing, and student presentations will be used to cover the course materials.

Major Assignments:

The students will be responsible for the following elements of class

1) Exam – Blue Team	(M)	20%
3) Proposal	(P)	30%
4) Exam - Final Pres.	(F)	30%
5) Class Part/teamwork	(C)	20%

An important aspect of this class is an ability to synthesize the concepts presented, with personal experiences, knowledge and abilities. Everyone in class will benefit from your participation.

Grading Policy:

Class members will be graded on a curve based on overall performance of the class. Late papers will not be encouraged. Grades will be affected by timelines of completion.

Academic Integrity:

All students are expected to understand and follow the University policy for Academic Integrity.

Don't cheat and don't plagiarize.

Here are five ways of plagiarizing:

1. Word-for-word continuous copying without quotation marks or mention of the author's name.
2. Copying many words and phrases without quotation marks or mention of the author's name.
3. Copying an occasional key word or phrase without quotation marks or mention of the author's name.
4. Paraphrasing without mention of the author's name.
5. Taking the author's idea without acknowledging the source.

If there is anything about plagiarism you do not understand, ask your professor.

Attendance:

Students are expected to attend all class sessions. Circumstances that prevent attendance will be honored up to two instances. Absences in excess of two times will result in a lowered grade for the course. Contact the instructor when a special situation arises. All absences require that the instructor be informed in advance.

Presentations:

This will be discussed during the first session of class. The ability to make coherent and thoughtful presentations is critical for personal success. Although most of us don't enjoy presentations, they will provide a strong foundation for future needs. Please try to approach the presentation as an opportunity to learn rather than an aspect to endure.

Course Outline – Systems Engineering II

Date	Topic(s)	Assignment(s)
Week 1	Systems Overview Logistics of the course Team Assignments	Logic of Failure
Week 2	Enterprise Architecture Overview Problem Statement	Logic of Failure
Week 3	Basic DODAF Examples RFP Delivered	Logic of Failure
Week 4	Basic DODAF II Examples	Logic of Failure
Week 5	Supporting Views of DODAF Examples	Logic of Failure
Week 6	Modeling and Simulation Examples	Logic of Failure
Week 7	Modeling and Simulation Midterm Exams handed out	Logic of Failure Team Model Development
Week 8	Blue Team Review (Midterm)	Logic of Failure
Week 9	Logic of Failure I	Case Study
Week 10	Logic of Failure II	Case Study
Week 11	Red Team Review	
Week 12	Working Session on Proposals	
Week 13	Oral Presentations of Proposals Proposals Due (Final Exam)	
Week 14	Systems Engineering II Summary Final Course Evaluations Proposal Down Select Brief	