

## Course Outline

### *On-campus Class*

**Course:** DEN 423 - Human Factors in Engineering and Design

**Instructor:** Name: Derek D. Podobas  
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**Office Hours:** Two-hours before each class session. Also via text: 949-842-6632

**Textbook:** Benjamin S. Blanchard (2010). Systems Engineering and Analysis. 5<sup>th</sup> Edition, Prentice Hall (ISBN: 0-13-221735-X)

**Course Prerequisite:** MTH215

### **Course Description:**

Application of a systems approach to the design of a human-systems interface. This course will focus specifically on the incorporation of human factors into the engineering design and operation of physical products.

### **Course Learning Outcomes:**

Upon successful completion of this course, students will be able to:

- Understand the systems approach to engineering design
- Model reference systems
- Understand the key role that human factors play in the operation of the overall system
- Incorporate the human-system interface requirement in a reference design
- Apply quantitative optimization methods to fine-tune the reference design to meet specified DfX requirements.

### **Course Requirements:**

Students are expected to attend all class sessions, participate in all class activities, complete exams as scheduled, and turn in all assignments on time. Failure to do so may result in the loss of points.

**Course Schedule and Class Content:**

Week	Class Content as of 12/21/17
1.	<p><b>Tuesday: 11/28/17</b></p> <ul style="list-style-type: none"> <li>• Introductions and course overview</li> <li>• Elements of an engineering system</li> <li>• The system’s modeling process</li> <li>• Systems modeling techniques</li> <li>• Human factors defined</li> <li>• Team project overview</li> <li>• Team Collaboration</li> </ul> <p><b>Thursday: 11/30/17</b></p> <ul style="list-style-type: none"> <li>• Human factors to be considered in a design</li> <li>• Human-systems interface defined</li> <li>• Mathematics of systems modeling</li> <li>• Team Collaboration</li> <li>• Mid-term overview and prep</li> <li>• Homework 1-4 assigned</li> </ul>

Week	Class Content as of 12/21/17
2.	<p><b>Tuesday: 12/5/17</b></p> <ul style="list-style-type: none"> <li>• Preliminary project systems design</li> <li>• Design of a human-system interface</li> <li>• Mathematics of systems optimization</li> </ul> <p><b>Thursday: 12/7/17</b></p> <ul style="list-style-type: none"> <li>• DfX constraints and fine-tuning of the final design</li> <li>• Team Collaboration</li> <li>• Midterm prep</li> <li>• Homework #1 due</li> </ul> <p><b>Saturday: 12/9/17</b></p> <ul style="list-style-type: none"> <li>• Midterm in class (8:30 am to 12:00 noon)</li> </ul>

Week	Class Content as of 12/21/17
3.	<p><b>Tuesday: 12/12/17</b></p> <ul style="list-style-type: none"> <li>• Final project systems design</li> <li>• Final exam overview and prep</li> </ul> <p><b>Thursday: 12/14/17</b></p> <ul style="list-style-type: none"> <li>• Team Collaborations</li> <li>• Homework #2 due</li> </ul>

Week	Class Content as of 12/21/17
4.	<p><b>Tuesday: 12/19/17</b></p> <ul style="list-style-type: none"> <li>• Final design systems optimization</li> <li>• Methods and Procedures (M&amp;P)</li> <li>• User training requirements</li> <li>• Homework #3 due</li> </ul> <p><b>Thursday: 12/21/17</b></p> <ul style="list-style-type: none"> <li>• Final Exam Prep</li> <li>• Team Project Presentations</li> <li>• Team Project Report due</li> </ul> <p><b>Saturday: 12/23/17</b></p> <ul style="list-style-type: none"> <li>• Final Exam in class (8:30am to 12 noon)</li> </ul>

**Note:** Your instructor reserves the right to make ongoing adjustments/changes to any part of the syllabus and/or class content throughout the duration of this course.

## Letter Grades and Grade Ranges:

Letter Grade	Range (%)
A	100 - 96
A-	95 - 90
B+	89 - 87
B	86 - 84
B-	83 - 80
C+	79 - 77
C	76 - 74
C-	73 - 70
D+	69 - 67
D	66 - 64
D-	63 - 60

Grades that are in-between will be rounded up/down to the nearest whole number. For example, 95.4 and below will become 95%, while 95.5 and above will round up to 96%.

## Grade Components:

The grade components for this course are:

Grade Component	Weight (%)
Midterm	25
Final	25
Homework (4x5%)	20
Class Attendance	10
Team Project Report	10
Team Project Presentation	10
Total	100

## **General NU Policies**

### **Ethics:**

Ethical behavior in the classroom is required of every student. Students are also expected to identify ethical policies and practices relevant to course topics.

### **Confidentiality:**

We are all bound by confidentiality in this class. You will want to discuss your company and its policies and procedures as they apply to the class material. Perhaps you will want to do your team project on a company confidential project. To assure that we can have a free and open discussion, I expect each of you to respect the confidentiality of what your classmates are willing to share.

### **Academic Integrity:**

Academic integrity is highly valued at each National University Campus. Students should always submit their assignments that represent their original words or ideas. If any words or ideas are used that do not represent the student's original words or ideas, the student must cite all relevant sources. Words or ideas that require citation include, but are not limited to, all hardcopy or electronic publications, whether copyrighted or not, and all verbal or visual communication when the content of such communication clearly originates from an identifiable source.

<http://www.nu.edu/OurPrograms/StudentServices/StudentConduct/AcademicIntegrity.html>

### **Plagiarism:**

Plagiarism is the presentation of someone else's ideas or work as one's own. Students must give credit for any information that is not either the result of original research or common knowledge. If a student borrows ideas or information from another author, he/she must acknowledge the author in the body of the text and on the reference page. Students found plagiarizing are subject to the penalties outlined in the Policies and Procedures section of the University Catalog, which may include a failing grade for the work in question or for the entire course.

<http://www.nu.edu/OurPrograms/StudentServices/WritingCenter/plagiarismStu.html>

**Technology:**

Students are expected to be competent in using word-processing, spreadsheet, and presentation software in this course. The use of the Internet and email is also required.

**Diversity:**

Learning to work with and value diversity is essential in every class. Students are expected to exhibit an appreciation for multinational and gender diversity in the classroom.

**Civility:**

As a diverse community of learners, students must strive to work together in a setting of civility, tolerance, and respect for each other and for the instructor. Rules of classroom behavior include but are not limited to the following:

- Conflicting opinions among members of a class are to be respected and responded to in a professional manner.
- Side conversations or other distracting behaviors are not to be engaged in during lectures, class discussions or presentations
- There are to be no offensive comments, language, or gestures

**Communication Skills:**

Both good written and oral communications are required in the classroom.

**Writing Across the Curriculum:**

Students are expected to demonstrate writing skills in describing, analyzing and evaluating ideas and experiences. Written reports and research papers must follow specific standards regarding citations of an author's work within the text and references at the end of the paper. Students are encouraged to use the services of the University's Writing Center when preparing materials. Please refer to the following link for more details.

<http://www.nu.edu/OurPrograms/StudentServices/WritingCenter/WritingAcrossTheCurr.html>