

Systems Design

ESI 6553 Sections 09G1/09G5/09GE/218G

Class Periods: Monday, Wednesday, and Friday 3:00-3:50pm

Location: CSE E122

Academic Term: Fall 2019

Instructor:

Dr. Nicholas J. Napoli

n.napoli@ufl.edu

Office Hours: Weil 446, Wednesday 4pm or by appointment,

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website and/or

- Seonho Park, seonhopark@ufl.edu, Office Location-TBA , Office Hours-TBA

Course Description

Broad introduction to systems engineering and the structured approaches needed to design complex systems. Emphasizes formulation of systems problems and approaches to their solution. Introduces basic mathematical techniques for dealing with systems design.

Course Pre-Requisites / Co-Requisites

Calculus, linear algebra, basics of statistics, ESI 6314

Course Objectives

The primary goal of this course is to challenge the way in which the student thinks; the way in which students approach problem solving for analyzing and designing systems. Secondary goals are to familiarize the student with systems engineering methodologies (the "systems approach"), systems engineering science concepts (e.g., decision analysis, etc.), systems management concepts, and systems modeling. Third Goal is to provide the fundamentals of how to propose a system design, present recommendations to management, and communicate effectively to agencies, management, and leadership using the developed systems thinking.

Students are encouraged to proactively participate throughout the semester. This includes classroom interactions and outside the classroom activities, such as group meetings. The nature of this material is not the kind that can be "spoon-fed" to students - the material requires active engagement of the material by the student. Reading assignments cannot be briefly scanned -- the student must read the material and reflect on the nature of what the author is trying to communicate.

If any student has any problems with the material, the instructor, the Teaching Assistant, homework assignments, etc., I encourage them to see me or phone as soon as possible. Don't wait for a small problem to escalate into a serious problem. I also encourage feedback from the students throughout the semester. You can leave a note in my mailbox (signed or unsigned), stop-by my office, or telephone.

Materials and Supply Fees

Not Applicable

Required Textbooks and Software

- How To Do Systems Analysis Primer and Casebook
By: John E. Gibson , William T. Scherer , William F. Gibson , Michael C. Smith
ISBN#: 978-1119179573
Wiley Series, Edition 1st, 2007
- Additional materials will be provided as needed
- An analytical software of your choice: MatLab, Python, R Studio, Excel, etc.

- Microsoft Word and PowerPoint

Course Outline

PART 1: Systems Methodologies

Top-down, goal-driven problem solving (and its relation to bottom-up problem solving)

History of operations research, systems engineering, and systems analysis

Overview of systems methodologies

Comparison and Contrasting of Systems Methodologies (i.e., NASA SE, DOD Standards, industry standards -- EIA, IEEE, CMM, CMMI, etc.)

Phases of systems engineering life cycle:

Systems definition phase

Systems design and development phase (included requirements, trade studies, etc.)

Systems implementation & maintenance phase (includes test and evaluation, etc.)

Systems management issues

Comparison of systems methodologies to contemporary/historical management approaches including:

PART 2: Decision Making for Systems Engineering

Introduction to critical issues and problems, basic decision analysis concepts

Overview of decision making pitfalls and common errors

Introduction to decision concepts, such as:

Measurement concepts

Pareto optimality/dominance

Rate and Weight

Decision Theory (Value and Utility Theory)

Decision trees

PART 3: Modeling for Systems Engineering

Introduction to systems modeling/problem formulation

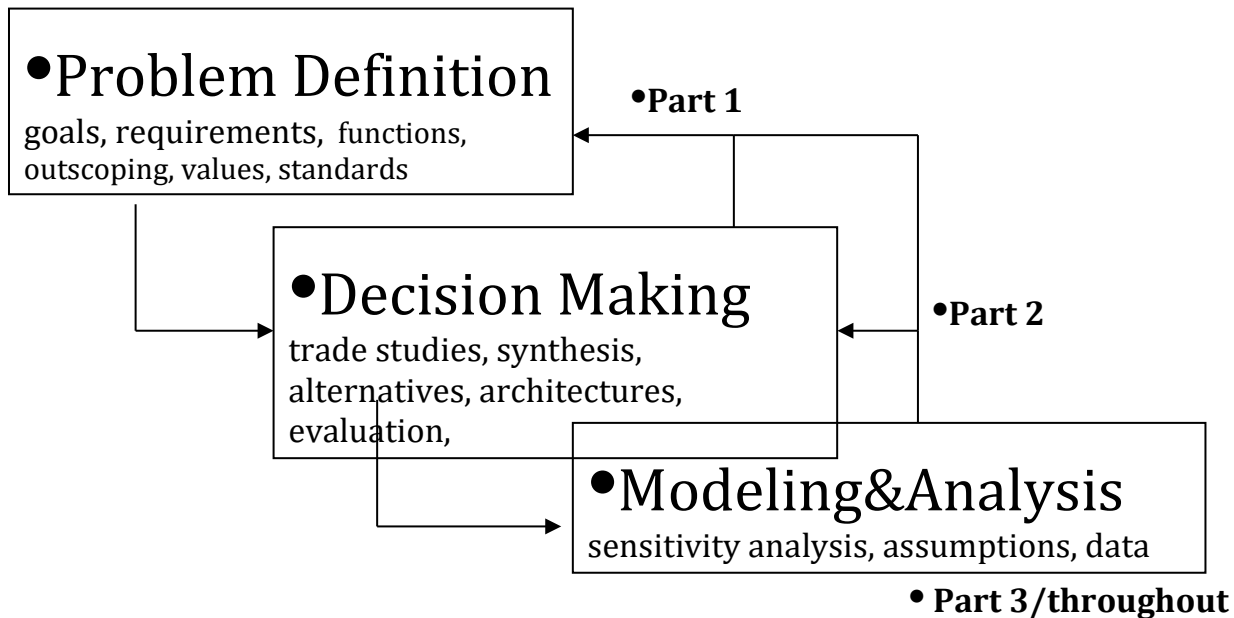
Basics of system models, introduced via cases

Making the 'business case'

Proposing/Marketing a System Design

Throughout: Discussion of real world problems via systems engineering and analysis case studies

ESI 6553 - Another View



Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is mandatory, if the students are local. Regarding remote students, attendance and participation is highly valued in this course, but it is recognized that other considerations are necessary to account for such as day-to-day career obligations. If you are a remote student and cannot attend the class, please reach out so we can accommodate and discuss your situation.

Attendance will counted at the beginning and end of the lecture. Students are required to attend classes and to participate in class discussions, small group exercises, and projects. Students are responsible for all material presented in each session.

Common tardiness, cell phone use, computer use, and etc. is completely understandable and acceptable. However, excessive tardiness, cell phone use, computer time, and any other factor that would affect your participation or cause distractions to your peers will motivate the instructor/TA to notify the student that it has become excessive. At that point, each infraction will count as an absence from the class curriculum and an absence for the day. Attendance is considered in the calculation of the student's final grade. If a student misses 15% or more of the class sessions (an absence), there will be grade penalties, and the instructor reserves the right to issue a failing grade for lack of attendance/absence.

Assignment are due at the beginning of class. However, late assignments will be accepted as long as the grades/evaluation for the assignment have not been released with no penalty towards the student's grade. If the grades have been released/assignments have been evaluated, your assignment is excessively late, a zero will be given.

Makeup quizzes or exams are not offered. Exceptions are made for extreme emergencies. Contact the instructor as soon as possible, to make arrangements. However, in no case will a makeup test be offered unless the instructor has been notified within 48 hours of the original test date and/or documentation of the circumstance is made available upon the instructor's request. Excused absences must be in compliance with university policies in the Graduate

Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>) and require appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Cases and Projects	May Vary per Case/ Project	35%
Class Participation	100 each	8%
Midterm Exam	100	20%
Final Exam	100	25%
System Design Proposal Paper	100	12%
Total		100%

Grading Policy

Percent	Grade	Grade Points
93.0 - 100.0	A	4.00
90.0 - 92.9	A-	3.67
87.0 - 89.9	B+	3.33
83.0 - 86.9	B	3.00
80.0 - 82.9	B-	2.67
77.0 - 79.9	C+	2.33
73.0 - 76.9	C	2.00
70.0 - 72.9	C-	1.67
67.0 - 69.9	D+	1.33
63.0 - 66.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any

condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: [https://www.dso.ufl.edu/documents/UF Complaints policy.pdf](https://www.dso.ufl.edu/documents/UF%20Complaints%20policy.pdf).

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.