Systems Architecture
ESI 6552 Section: 1FE2 / 2FED/ CAMP
Class Periods: M, W, F | Period 6 (12:50 PM – 1:40 PM)
Location: Online/NEB 0100
Academic Term: Spring 2023

Instructor:
Dr. Mengyu Li
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Office Hours: Mondays, 2 – 3 pm (in person or via Canvas Zoom Conferences)

Teaching Assistants:
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Course Description
System architecture is an abstract description of the entities of a system and the relationship between those entities. This course will acquaint students with concepts of systems architecture and the application of related methods to real-world systems. It provides foundations for developing and evaluating architectures for systems of systems, as well as process for generating functional, physical, and operational architecture from a top-level operations concept. This is a 3 credit hours project course.

Course Pre-Requisites / Co-Requisites
Prerequisite: calculus, linear algebra.

Course Objectives
Upon completion of this course, students will obtain foundational knowledge of the entities of a system and relationships among the entities from a system architecture perspective. Students will understand foundational knowledge of principles, processes, and tools of system architecting. Students will be able to analyze and critique the architecture of existing systems and structures and lead the early, conceptual phases of the system development process.
Special Emphasis:
- Understanding of basic principles
- Applications to system architecture analysis and development
- This is a course in **how** to think, not **what** to think

Materials and Supply Fees
This class is based primarily on lectures. Students may attend lectures in person or watch the lectures on video. Any additional supplemental material will be provided. Supply fees are not applicable in this course.

<u>Recommended</u> Textbooks and Software
Textbooks:
- E. Crawley, B. Cameron, and D. Selva, *System Architecture: Strategy and Product Development for Complex Systems,* 1st edition, 2006, Pearson. ISBN: 9780133975345.
- Maier, *The Art of Systems Architecting*, 3rd edition, 2009, CRC Press. ISBN: 781420079135.

Software:
- Microsoft® Excel, Word, and PowerPoint
- Any video recording/editing program

Course Schedule*
*This is a *tentative* outline. The instructor reserves the right to make changes as she sees necessary.

Week	Date (Mon – Fri)	Topic
PART 1: Introduction to System Architecture (Week 1-4)		
1	Jan 9 – 13	Course Introduction System Review Forms & Functions **Assignment 1**
2	Jan 16 – 20 (Jan 16 holiday)	Forms & Functions (cont.) System Emergence
3	Jan 23 – 27	System Emergence (cont.) System Emergence Extension **Assignment 2**
4	Jan 30 – Feb 3	Thinking about Complex Systems **Case study 1: system failure**
PART 2: Systems Thinking and System Dynamics (Week 5-9)		
5	Feb 6 – 10	Systems Thinking: Policy Resistance; the Iceberg Model **Quiz 1**
6	Feb 13 – 17	Causal Loop Diagrams
7	Feb 20 – 24	Structure and Behavior of Dynamic Systems **Case study 2: policy resistance**
8	Feb 27 – Mar 3	Structure and Behavior of Dynamic Systems (cont.)
9	Mar 6 – 10	Upstream/Downstream Influences **Case study 3: systems thinking**
Spring break		
PART 3: Analysis of System Architecture (Week 10-15)		
10	Mar 20 - 24	Midterm Project Review **Midterm Project Peel Eval**
11	Mar 27 - 31	System Reliability
12	Apr 3 – 7	Analysis of Formal Relationships **Quiz 2**
13	Apr 10 - 14	External/Internal Functions **Assignment 3**
14	Apr 17 - 21	Solution-Neutral Functions and Concepts
15	Apr 24 – 28 (Apr 27, 28 reading days)	From Concept to Architecture
	Final Exam	**5/04/2023 @ 7:30 AM - 9:30 AM**

Attendance Policy, Class Expectations, and Make-Up Policy

- This course is offered through the UF EDGE program. All lectures will be recorded and made available to all students (EDGE and on-campus). Attendance and participation are highly valued in this course. Attendance is not required but will be considered in the calculation of the student's final grade. The instructor reserves the right to issue a failing grade for lack of attendance/participation.
- Attendance is required exams online via Canvas Honorlock online proctoring services. Makeup quizzes or exams are **not** offered. Exceptions are made for extreme emergencies. Excused absences must be consistent with university policies in the Graduate Catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance) and require appropriate documentation. Additional information can be found here: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx. 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.

- Late Assignment Policy: The assignments are to be submitted on or before the posted due date. Students are responsible for all material presented in each session. <u>Late submission penalty of 25% per day (4 days maximum allowance) will be applied to late submissions.</u> If the grades have been released/assignments have been evaluated, your assignment is excessively late, a zero will be given. **It is your responsibility to visit the course website regularly, read the posted announcements and be aware of assignment submission deadlines and procedures.**

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Assignments (3)	10 each	20% (5% or 10% each)
Case Studies (3)	50 each	30% (10% each)
Quizzes (2)	10 each	10% (5% each)
Midterm	100	20%
Final	100	20%
		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
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, 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 gatorevals.aa.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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

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: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

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 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.

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

Disclaimer

The instructor reserves the right, when necessary, to alter the grading policy, change examination dates, and modify the syllabus and course content. Modifications will be announced on the course website. Students are responsible for announced changes.