

## Enterprise Software Engineering Practices

CIS 4930 Sections ZZY1(26437) & 1UFO (26438)

**Class Periods:** MWF, period 10 (5:10 pm - 06:00 pm) & UF Online (Asynchronous)

**Location:** Virtual - Zoom

**Academic Term:** Fall 2024

### **Instructor:**

Shaghayegh "Shae" Esmaeili

[esmaeili@ufl.edu](mailto:esmaeili@ufl.edu)

Office Hours: By appointment

### **Teaching Assistant/Peer Mentor/Supervised Teaching Student:**

Please contact through the Canvas website

- TBA

### **Course Description**

This course will introduce students to modern software engineering practices used to build software in large enterprises. Students will learn about frameworks and tools that help organizations with hundreds or even thousands of engineers collaborating to deliver software. Students will expand upon their knowledge of the Software Development Life Cycle to better understand how to contribute code to existing codebases, automate testing and deployment activities, and proactively monitor and support their software. Students will learn how to evaluate requirements from a business and customer perspective, ensuring that they contribute software that is impactful. These real-world skills will help students stand out as they pursue full-time software engineering opportunities and hit the ground running in their first industry jobs.

The course will be delivered virtually.

3 Credits

Grading Scheme: Letter Grade

### **Course Pre-Requisites / Co-Requisites**

CEN 3031 Intro to Software Engineering

\*Students without this prereq course should be familiar with git, how to make open source contributions, agile/scrum methodologies, and developing software as part of a team.

### **Course Objectives**

By the end of the semester students will:

- Understand how large enterprises manage software projects across dozens of engineering teams
- Understand the operations and responsibilities of different functional teams within a large technology organization
- Learn about different types of enterprise architecture and associated design patterns
- Expand upon the standard software development life cycle, from understanding the business need to deployment and ultimately decommissioning or replacement of software
- Be prepared to hit the ground running in their first industry software engineering job, increasing their hireability and time to productivity.

### **Guest Lectures Bios**

This course will be taught by UF alumni who are members of the CISE Industry Advisory Board, as well as additional industry guest lecturers.

**David Wright** graduated from the University of Florida in 1987 with a B.S. in Computer Engineering. Dave worked at United Technologies achieving the position of Associate Technical Fellow. He then worked at Nielsen achieving

the position of Senior Vice President. Dave has 58 granted patents and contributed to winning two Emmy Awards for Technology and Engineering. He is an enthusiastic developer of talent, coach and mentor.

**Sarvenaz Myslicki** graduated from the University of Florida in 2013 with a B.S. in Computer Science. Currently, she is Vice President of Technology at American Express, where she leads a team of 375+ software engineers responsible for the americanexpress.com website, Loyalty Experiences, and Site Reliability Engineering. She is a non-profit leader within the Society of Women Engineers, a passionate mentor and career coach, and a published author.

**Michael Adrian** graduated from the University of Florida in 2009 with an M.S. in Information Systems and Operations Management. He’s spent his career since then with ExxonMobil, where he started slinging code for technical applications (which he still loves), and now acts as the Enterprise Architect driving architecture patterns and enablement for how over 7,000 applications are built, delivered, and supported. He is a lead in ExxonMobil’s Software Development and Applications Enablement job families, and is passionate about helping people meet their dreams.

**Joseph Cutrono** graduated from the University of Florida in 2007 with a B.S. and M.S. in Computer Science. He currently works as Chief Technology Officer at iSolved. Prior to that, Joseph worked for UKG as a Sr. Director of Engineering for their Developer Experience Platform team. In this role he provided tooling for CI/CD, Quality, and Observability services for their engineering teams. He is currently the Chair of the University of Florida CISE Industry Advisory Board and passionate about contributing toward the UF CISE curriculum.

**Usha Suryadevara** graduated from the University of Florida in 2001 with an MS in Computer Science. She currently works as Head of Engineering for Drizly, an Uber Company where she oversees Retailer technologies and Infrastructure organizations. In this role she is responsible for building a secure, reliable and scalable alcohol marketplace. She has over two decades of building and scaling software platforms driving business growth. She is a non-profit leader with a passion to advance women in the tech industry and an adjunct professor at UF.

**Materials and Supply Fees**

Not applicable

**Relation to Program Outcomes (ABET):**

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Medium
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
3. An ability to communicate effectively with a range of audiences	Medium
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	High

6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Low
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	High

### Required Textbooks and Software

- N/A - Course notes are developed by the instructors

### Recommended Materials

- N/A

### Required Computer

UF student computing requirement: <https://news.it.ufl.edu/education/student-computing-requirements-for-uf/>

### Course Schedule

The provided schedule is tentative and subject to change.

Week	Dates	Topics	Due
0 + 1	Aug 23 - Aug 30	- Course Introduction - Measuring Success, Org Structures, & Large-Scale Agile Frameworks - Career Prep: Resumes & Public Portfolios - Code Collaboration: Git in Large Enterprises	Review Syllabus <b>Participation (2.5 pt):</b> Complete Welcome Survey <b>Assignments 1 &amp; 2 (6 pt):</b> Resume & LinkedIn
2	Sep 2 - Sep 6	- Career Prep: Technical Interviews, Offers, & Benefits - Career Prep: Personal Branding & Networking	<b>Assignment 3 (6 pt):</b> Git Branching Strategies <b>Partner Activity 1 (10 pt):</b> Mock Technical Interview
3	Sep 9 - Sep 13	- Code Review & Communication - Refactoring & Debugging - Code Readability & Documentation	
4	Sep 16 - Sep 20	- Kubernetes - Open Source, Dependency Management, & Licensing - Introduction to Enterprise Architecture	<b>Assignment 4 (6 pt):</b> Project Management & Communicating Up
5	Sep 23 - Sep 27	- Service-Oriented Architecture - Message Broker & Event-Based Architecture - AI/ML Real World Applications	<b>Assignment 5 (6 pt):</b> Open Source Part 1
6	Sep 30 - Oct 4	- REST APIs & Open API Specification - Augmented & Virtual Reality - Software Audits, Regulatory Impacts, and Data Governance	<b>Partner Activity 2 (5 pt):</b> Open Source Code Review
7	Oct 7 - Oct 11	- Build Engineering - User Experience & Design - High Performance Computing	<b>Assignment 6 (6 pt):</b> REST API Design

8	Oct 14 - Oct 18	- Web Development Frameworks - Front-End & Back-End Web Development	<b>Assignment 7 (6 pt):</b> React Application
9	Oct 21 - Oct 25	- Web Development Special Topics: Performance & Accessibility - Mobile App Development (Part 1) - Mobile App Development (Part 2)	<b>Assignment 8 (6 pt):</b> Mobile Experience Building
10	Oct 28 - Nov 1	- DevOps & Site Reliability Engineering - Public vs Private Cloud Containerization & Orchestration - Serverless Computing, PaaS, & IaaS	<b>Partner Activity 3 (5 pt):</b> Mobile UX Feedback
11	Nov 4 - Nov 8	- Software Modernization & Innovation in Large Enterprises - Software Quality Overview - Big Data & Analytics	<b>Assignment 9 (6 pt):</b> Event-Driven Architecture
12	Nov 11 - Nov 15	- Test Driven Development & Automated Unit Tests - Release Management, Change Management, & CI/CD	<b>Assignment 10 (6 pt):</b> Automated Unit Testing
13	Nov 18 - Nov 22	- Production Support - InfoSec: Risk & Vulnerability Management - InfoSec: Access Control (ID, AuthN, AuthZ)	<b>Assignment 11 (6 pt):</b> Static Code Analysis
14	Nov 25 - Nov 29	THANKSGIVING BREAK	<b>Assignment 12 (6 pt):</b> Observability
15	Dec 2 - Dec 4	- 1st 90 Days in the Workforce - Recent Grad Panel	<b>Participation (2.5 pt):</b> Complete Closing Survey
16		No Final Exam	Complete Course Eval

### ***Attendance Policy, Class Expectations, and Make-Up Policy***

**Late Policy:** Coursework (including assignments, etc.) will lose 20% per day late.

**Regrade Request Policy:** Students can request a re-grade by sending an email with the subject "ESEP Re-grade Request" to Shae Esmaeili: [esmaeili@ufl.edu](mailto:esmaeili@ufl.edu).

\* Note that the grade may go up, down, or stay the same after the re-grade

**Attendance Policy:** Attendance credits count for 5% of total grade, and students get 3 "free" absences. Lectures during drop/add are not counted. Students should ensure they verify which section they are registered for through ONE.UFL. This will help students follow the correct attendance procedure based on whether they are a campus or online student.

- UF Campus Students Section ZZY1(26437): Attendance credit for each live lecture will be earned by attending at least 40 minutes of each live Zoom lecture. Students need to make sure their full name is listed in Zoom, as that is the only way to give them credit.
- UF Online Students Section 1UFO(26438): Attendance for UF Online sections will be determined through discussion topics instead of live zoom attendance.

\* Note that there may occasionally be "recording-only days," in which case both UF Online and Campus students will be given an attendance assignment in Canvas.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

### ***Evaluation of Grades***

<b>Assignment</b>	<b>Total Points</b>	<b>Percentage of Final Grade</b>
Assignments (12)	66	69%
Partner Activities (3)	20	21%
Feedback Surveys (2)	5	5%
Attendance	5	5%
		100%

### ***Grading Policy***

<b>Percent</b>	<b>Grade</b>	<b>Grade Points</b>
94.0 - 100	A	4.00
90.0 - 93.9	A-	3.67
87.0 - 89.9	B+	3.33
84.0 - 86.9	B	3.00
80.0 - 83.9	B-	2.67
77.0 - 79.9	C+	2.33
74.0 - 76.9	C	2.00
70.0 - 73.9	C-	1.67
67.0 - 69.9	D+	1.33
64.0 - 66.9	D	1.00
61.0 - 63.9	D-	0.67
0 - 60.9	E	0.00

More information on UF grading policy may be found at:

<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 <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/>.

### ***In-Class Recording***

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil

proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***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/process/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 varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

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 Undergraduate Coordinator
- HWCoe Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, [pld@ufl.edu](mailto:pld@ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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:** <https://counseling.ufl.edu>, 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](mailto: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](mailto:Learning-support@ufl.edu).  
<https://elearning.ufl.edu/>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; <https://career.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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/getting-help/>;  
<https://distance.ufl.edu/state-authorization-status/#student-complaint>.