

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

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Office Hours: By appointment

Teaching Assistant:

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Office Hours: By appointment

Peer Mentor/Supervised Teaching Student:

Please contact through Slack

- Rohit Inampudi
- Daniel Lai
- Jyotiraditya Lnu
- Archit Mittal

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

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	Review Syllabus

		<ul style="list-style-type: none"> - Measuring Success, Org Structures, & Large-Scale Agile Frameworks - Career Prep: Resumes & Public Portfolios - Code Collaboration: Git in Large Enterprises 	Participation (2.5 pt): Complete Welcome Survey Assignments 1 & 2 (6 pt): Resume & LinkedIn
2	Sep 2 - Sep 6	<ul style="list-style-type: none"> - Career Prep: Technical Interviews, Offers, & Benefits - Career Prep: Personal Branding & Networking 	Assignment 3 (6 pt): Git Branching Strategies Partner Activity 1 (10 pt): Mock Technical Interview
3	Sep 9 - Sep 13	<ul style="list-style-type: none"> - Code Review & Communication - Refactoring & Debugging - Code Readability & Documentation 	
4	Sep 16 - Sep 20	<ul style="list-style-type: none"> - Kubernetes - Open Source, Dependency Management, & Licensing - Introduction to Enterprise Architecture 	Assignment 4 (6 pt): Project Management & Communicating Up
5	Sep 23 - Sep 27	<ul style="list-style-type: none"> - Service-Oriented Architecture - Message Broker & Event-Based Architecture - AI/ML Real World Applications 	Assignment 5 (6 pt): Open Source Part 1
6	Sep 30 - Oct 4	<ul style="list-style-type: none"> - REST APIs & Open API Specification - Augmented & Virtual Reality - Software Audits, Regulatory Impacts, and Data Governance 	Partner Activity 2 (5 pt): Open Source Code Review
7	Oct 7 - Oct 11	<ul style="list-style-type: none"> - Build Engineering - User Experience & Design - High Performance Computing 	Assignment 6 (6 pt): REST API Design
8	Oct 14 - Oct 18	<ul style="list-style-type: none"> - Web Development Frameworks - Front-End & Back-End Web Development 	Assignment 7 (6 pt): React Application
9	Oct 21 - Oct 25	<ul style="list-style-type: none"> - Web Development Special Topics: Performance & Accessibility - Mobile App Development (Part 1) - Mobile App Development (Part 2) 	Assignment 8 (6 pt): Mobile Experience Building
10	Oct 28 - Nov 1	<ul style="list-style-type: none"> - DevOps & Site Reliability Engineering - Public vs Private Cloud Containerization & Orchestration - Serverless Computing, PaaS, & IaaS 	Partner Activity 3 (5 pt): Mobile UX Feedback
11	Nov 4 - Nov 8	<ul style="list-style-type: none"> - Software Modernization & Innovation in Large Enterprises - Software Quality Overview - Big Data & Analytics 	Assignment 9 (6 pt): Event-Driven Architecture
12	Nov 11 - Nov 15	<ul style="list-style-type: none"> - Test Driven Development & Automated Unit Tests 	Assignment 10 (6 pt): Automated Unit Testing

		- Release Management, Change Management, & CI/CD	
13	Nov 18 - Nov 22	- Production Support - InfoSec: Risk & Vulnerability Management - InfoSec: Access Control (ID, AuthN, AuthZ)	Assignment 11 (6 pt): Static Code Analysis
14	Nov 25 - Nov 29	THANKSGIVING BREAK	Assignment 12 (6 pt): Observability
15	Dec 2 - Dec 4	- 1st 90 Days in the Workforce - Recent Grad Panel	Participation (2.5 pt): 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.

* 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

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

Grading Policy

Percent	Grade	Grade Points
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.bluera.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
- Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@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: <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

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://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>.