

SOFTWARE ENGINEERING

CEN5035 Sections 3982 and CERT

Class Periods: MWF 5, 11:45 AM - 12:35 PM

Location: CSE A101

Academic Term: Spring 2023

Instructor:

Steve Thebaut

smt@cise.ufl.edu (the best way to reach me!)

352-359-2507

Office Hours via Zoom (tentative): Tu/Th10-11:30 AM or by appointment (request appointment via e-mail)

Website: (under construction)

The course website will be used to post announcements, the course syllabus, self-study lecture notes, etc. **To access the website from a NON-UF network, students will need to establish a Gatorlink VPN connection.**

In addition, a Canvas course shell will be available via E-Learning (<https://elearning.ufl.edu/>) to support assignment posts and submissions, Zoom meetings, etc., and to view scores/grades.

Teaching Assistant/Peer Mentor/Supervised Teaching Student: (TBD)

Course (Catalog) Description:

Topics in projects organization, specification techniques, reliability measurement, documentation; 3 Credits; Grading Scheme: Letter Grade; Pre-Requisites: COP 3504 and COT 3100

Expanded Course Pre-Requisites / Co-Requisites:

You should already be familiar with individual and team-based software development/programming using a high-level language (C, C++, Java, SPARK, APL, Lisp, Python, etc.), and have a basic knowledge of algorithms, data structures, and discrete math. (A few program/design examples in the texts are given in Java or Python, but no previous knowledge of these specific languages is required.)

Course Objectives

CEN5035 is **not a programming course** or a practicum in agile software development. Rather, it focuses on critically surveying a broad assortment of fundamental concepts, principles, and knowledge of SE activities that are important for the production of reliable and secure software, but that may not be familiar to some CS/CE students. These include identifying a development process appropriate to the circumstances, eliciting and documenting requirements, using reviews and inspections plus machine-based testing in software development, understanding software evolution, and becoming acquainted with techniques associated with developing *high-dependability* (e.g., safety/mission-critical) software systems, including formal methods. This will be accomplished through topical readings, the review of self-study lecture notes, and other individual or group activities and assignments.

Learning Modalities:

Students will explore course topics via assigned readings, the review of instructor provided self-study lecture notes, and various other learning activities that may or may not involve course content covered in the readings or lecture notes. In addition to physical face-to-face class meetings, recorded or online-only classes may be utilized when deemed necessary and appropriate by the University.

Policies Related to Covid-19, RSV, and Influenza:

The University of Florida *recommends* wearing masks on campus and encourages everyone to get vaccinated and stay current with boosters to minimize infection risks.

If you become ill, please do not come to class. If you have Covid, RSV, or Influenza symptoms, please seek treatment ASAP and get tested. If you test positive, stay home and follow Centers for Disease Control and Prevention guidelines for isolation.

Note that a mask is **required** when attending face-to-face office hours with the course instructor or when meeting face-to-face with teaching assistants/graders outside class.

Materials and Supply Fees: N/A

Required and Optional Textbooks and Software:

In keeping with the goal of critically surveying a *broad* assortment of fundamental concepts, principles, and other important aspects of SE, the primary (required) textbook is:

SOFTWARE ENGINEERING

Ian Sommerville
2016, **10th** Edition
ISBN 0-13-394303-8

Note that access to the most recent (10th) edition is **required**.

In addition, a supplementary (**optional**) textbook is also recommended for students whose vocational goals focus primarily on working with *recent development techniques, environments, and tools for incrementally developing software products using agile methods that will execute in the cloud and/or that will be maintained and managed by a DevOps team*:

ENGINEERING SOFTWARE PRODUCTS: AN INTRODUCTION TO MODERN SOFTWARE ENGINEERING

Ian Sommerville
2019, 1st Edition
ISBN 9780135210642

It concentrates on topics that most traditional SE textbooks that focus on large, custom (“one-off”) software system **projects** do not. Read the following blog post for more information about the distinction between software *products* and *projects*: <https://iansommerville.com/technology/teaching/out-with-uml/>

Course Schedule/Topics (tentative):

The following topics will be covered in the order given. Chapter numbers refer to the required SOMMERVILLE text; “LNO” = Lecture Notes Only.

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|---------------------------------------|--|
| (1) Introduction (Ch 1) | (6) Software Evolution (Ch 9) |
| (2) Software Processes (Ch 2) | (7) Dependable Systems (Ch 10) |
| (3) Agile Software Development (Ch 3) | (8) Safety Engineering (Ch 12) |
| (4) Requirements Engineering (Ch 4) | (9) Formal Specification (LNO) |
| (5) Software Testing (Ch 8) | (10) Introduction to Proofs of Correctness (LNO) |

Attendance Policy, Class Expectations, and Make-Up Policy

Limited physical face-to-face class attendance is required in connection with some class activities (e.g., scheduled exams and possibly a few presentations and/or learning exercises).

Students are expected to complete all assignments in a timely manner. Late assignment submissions will not be accepted except in extenuating circumstances associated with a period of excused absence. Excused absences must be consistent with university policies in the Graduate Catalog (<https://catalog.ufl.edu/graduate/regulations>) and require appropriate documentation. Additional information can be found here:

IMPORTANT: please do NOT schedule elective activities (family gatherings, interview trips, weddings, divorces, vacations, visa application trips, etc.) that could interfere with completing course assignments on-time.

Grading Policy/Evaluation of Grades:

Course grades will be based **solely** on: (1) a few individual and/or small group essays, reports, and/or problem sets (up to 1/3 of course grade); and (2) two 50-minute in-class exams (2/3 or more of course grade).

Tentative Exam schedule: **Exam 1** (covers topics 1-5) – Monday, March 6; **Exam 2** (covers topics 6-10) – Monday, April 24. Note: there is no “comprehensive final exam” for this course, and no plans to use the scheduled final exam period (week of April 29-May 5), but students will be expected to make themselves available at this time should this become necessary for some unexpected reason.

Exam Grading Errors: General exam re-grade requests (AKA “fishing expeditions”) are NOT accepted. Suspected grading errors (with evidence) should be brought to the instructor’s attention ASAP, but no later than one week after graded exams are made available for review, for appropriate consideration. Your original, UNALTERED, exam) must be returned together with a correction request form (to be made available) to the instructor. Note that partial credit policies are not subject to debate.

There will be no online (e.g., “Honorlock”) exams.

Course letter grades will be determined at the end of the semester. In the past, some typical (BUT NOT PRE-DETERMINED) grade distributions for CEN5035 have been A (4.00 grade points): 10-20% of students completing the course, A- (3.67 grade points): 25-35%, B+ (3.33 grade points): 25-35%, B (3.00 grade points): 10-20%, lower than a B (0.00-2.67 grade points): 0-5%.

Grade requirements for graduation: Note that graduate students must have an overall GPA of 3.0 (B average) or better. (A B- average is equivalent to a GPA of 2.67, and therefore does NOT satisfy this requirement.)

More information on UF grading policy for graduate courses may be found at:

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

Fishbowl Group Discussion Format: Various forms of “fishbowl discussions/conversations” may be employed in this class. In a fishbowl activity, a small group of students is chosen to discuss and/or demonstrate their knowledge and understanding of a topic, provide logical arguments for a position concerning a topic, etc. The rest of the class watches, listens, evaluates the arguments being presented, and reflects on new insights provided by the discussion. The presenter/observer roles change on a regular basis.

The fishbowl is a method to organize presentations and group discussions that offers the benefits of small group discussions – most notably, a spontaneous, conversational approach to discussing issues – within large group settings. This is done by arranging the room so that the speakers are seated in the center of the room with other participants sitting around them in a circle watching their conversation ‘in the fishbowl.’

- https://www.unicef.org/knowledge-exchange/files/Fishbowl_production.pdf

Course Feedback:

Please provide the instructor with your feedback/recommendations about this course at any time during or after the semester in which you are enrolled. This may be done verbally (e.g., during online office hours), in writing, or via the end-of-semester course evaluation. Suggestions about how to improve the course *at any time* will be especially appreciated.

Instructor Biography:

Steve Thebaut received the BA in Mathematics from Duke University in 1977, and the MS and PhD in Computer Science from Purdue University in 1979 and 1983, respectively. His research interests have included software requirements engineering, software testing and formal verification, and software engineering technology transfer. He has received funding from the National Science Foundation, IBM, the Florida Department of Education, the Florida High Technology and Industry Council, the Sino-Software Research Center at Hong Kong University of Science and Technology (HKUST), the Software Engineering Research Center (SERC), an NSF Industry/University Cooperative Research Center, and the Software Engineering Institute (SEI) at Carnegie Mellon University, where he was an invited lecturer in the SEI production of "Software Project Management," a nationally distributed video-based continuing education course. From 1991-1993 he was a Visiting Scholar in the Department of Computer Science at the Hong Kong University of Science and Technology (HKUST), and was an Educational Consultant and Visiting Lecturer in Software Engineering at Infosys Technologies, Ltd., Mysore, India in 2009. He has been a course developer and consultant for IBM IS&PG Technical Education, and has served on the program committee of the IEEE International Conference on Software Engineering Education and Training. He was Associate Editor of the International Journal of Computer and Software Engineering from 1990-1996, UF Site Director of the Software Engineering Research Center (SERC) from 1994-2004, and Associate Chair of the Computer and Information Science and Engineering Department at UF from 2000-2015.

Additional Important Information/Resources for Students:***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.

End-of-Semester Course Evaluation via GatorEvals:

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.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 <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.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/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 believe that 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: <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://lss.at.ufl.edu/help.shtml>.

Career Resource 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: <http://www.distance.ufl.edu/student-complaint-process>.