Software Engineering
CEN 5035   Section 237G(11384)
Class Periods: N/A
Location: ONLINE
Academic Term: Fall 2020

Instructor:
Steve THEBAUT
smt@cise.ufl.edu (the best way to reach me!)
352-294-6672 (messages only – checked occasionally)
Office Hours via Zoom (tentative): M/Th 11:30 AM - 1:00 PM or by appointment (request appointment via e-mail)
Website: www.cise.ufl.edu/class/cen5035/fa20.html

The course website will be used to post announcements, the course syllabus, self-study lecture notes, the weekly course schedule, discussion posts and essay grading rubrics, etc. In addition, a Canvas course shell will be available via E-Learning (https://elearning.ufl.edu/) to support online course discussion, assignment posts and submissions, view assigned scores/grades, etc.

Grader / Course Administrative Assistant: (contact via e-mail or through the Canvas website)
Shashank BANTAKAL
sbantakal@ufl.edu

Course Description
Credits: 3, Grading Scheme: Letter; Topics in projects organization, specification techniques, reliability measurement, documentation.

CEN 5035, Software Engineering (SE), is ***not*** a programming course or a practicum in agile software development. Rather, it is a reading/discussion/exercise/essay-writing course that focuses on introducing software engineering activities that are important for the production of reliable and secure software ***products***. In particular, it covers topics that most traditional SE survey courses (and 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 *products* and *projects:* https://iansommerville.com/technology/out-with-uml/

The textbook used, <u>Engineering Software Products</u> by Ian Sommerville, focuses on *modern development techniques whereby software will be developed incrementally using agile methods, execute on the cloud, its security will be critical and it will be maintained and managed by a DevOps team.*

The course will employ a "flipped learning" model of sorts, whereby students will explore various topics via assigned readings, the review of instructor/author provided self-study lecture notes, active participation in on-line discussions, exercises, and writing short essays that may require knowledge or insights not directly provided in the readings or lecture notes. *In addition,* the instructor will introduce and provide brief recorded overviews of course topics, answer questions related to previously assigned lecture notes, readings, and problem sets, elucidate critical concepts, etc.

Course Pre-Requisites / Co-Requisites
COP 3504 (Advanced Programming Fundamentals for CIS Majors) and COT 3100 (Applications of Discrete Structures).

You should already be familiar with individual and team-based software development/programming using a high-level language (C, C++, Java, Python, etc.), and have a basic knowledge of algorithms, data structures, and discrete math. (Program examples in the text are given in Python, but no previous knowledge of this language is required.) In addition, the non-programming, reading, discussion, and writing-intensive nature of this course is such that students should already be comfortable with English, using the technical terms necessary for computer

scientists/engineers, and communicating effectively with others. Therefore, it may be inadvisable for some students whose first or native language is not English to take CEN 5035 during their first semester at UF.

Course Objective

To familiarize students meeting the course prerequisites who may be taking a first or second course in software engineering, and/or who may be thinking about developing a software product but do not have extensive software engineering experience, with the principal activities that are important for the production of reliable and secure software products. This will be accomplished through readings, virtual discussions, exercises, and writing brief essays on such topics and techniques related to agile software engineering, features, scenarios and user stories, software architecture, cloud-based software, micro-services architecture, security and privacy, reliable programming, testing, and DevOps and code management.

Materials and Supply Fees: N/A

Required Textbook
- Engineering Software Products: An Introduction to Modern Software Engineering
- Ian Sommerville
- First Edition, 2019
- ISBN 9780135210642

Additional Recommended Materials: N/A

Course Schedule/Topics (tentative)
The following topics will be covered in the order given. Chapter numbers refer to the SOMMERVILLE text.

(1) Software Products (Ch 1)	(6) Microservices Architecture (Ch 6)
(2) Agile Software Engineering (Ch 2)	(7) Security and Privacy Software (Ch 7)
(3) Features, Scenarios, and Stories (Ch 3)	(8) Reliable Programming (Ch 8)
(4) Software Architecture (Ch 4)	(9) Testing (Ch 9)
(5) Cloud-Based Software (Ch 5)	(10) DevOps and Code Management (Ch 10)

If time permits, a few additional advanced topics (e.g., Software Safety, Formal Methods in SE) may also be covered.

Online Course Recording
Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Assignment Policy, Class Expectations, and Make-Up Policy
Students are expected to complete all assigned readings, actively participate in on-line discussions, and submit required essays in a timely manner. Late submissions of required discussion posts/essays will not be accepted except in extenuating circumstances associated with a period of excused absence. (Excused absences must be in compliance with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations/) and require appropriate documentation.)

In particular, 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 **<u>solely</u>** on (1) required participation/ engagement in Canvas-based online discussions (grading rubric(s) to be provided) and (2) 10-14 original essays on course-related topics/exercises that require research, knowledge, or insights not directly provided in the textbook or lecture notes. There will be *no* exams.

The nominal grading break-down is as follows:
- Participation/engagement in Canvas-based class discussions: 50%
- Written essays: 50%

While quantitative evaluation ("grading") of discussion contributions and essays (via word counts, etc.) is relatively straightforward, evaluating their *quality* is inherently subjective, but I will provide rubrics that will identify specific participatory behaviors in discussions and attributes of original essays that one should aspire to. Obviously, evidence of having completed all assigned readings, exercises, and other expected preparatory activities in advance together with thoughtful, helpful insights is paramount in this regard!

Course letter grades will be determined at the end of the semester on the basis of an overall curve. In the past, the typical (NON-PRESCRIPTIVE) grade distribution has 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%.

<u>Grade requirements for graduation</u>: Graduate students must have an overall GPA of 3.00 (B average) or better. (Note: a B- average is equivalent to a GPA of 2.67, and therefore does NOT satisfy this requirement.)

More information on UF grading policy may be found at: https://catalog.ufl.edu/graduate/regulations/

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, and will be greatly 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, testing and 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 I/UCRC), 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. He has been a course developer and consultant for IBM's IS&PG Technical Education program, and has served on the program committee of the Conference on Software Engineering Education. He was Associate Editor of the International Journal of Computer and Software Engineering from 1990-1996.

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.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://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://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 suppor*t*, 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://care.dso.ufl.edu.

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