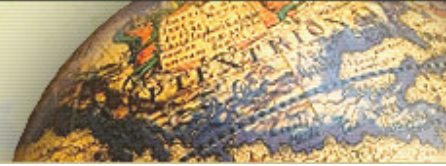




CEN4020

Software Engineering I

Dr. David A. Gaitros



Course Description – CEN4020:

(Prerequisite/Co-Requisite: COP4530) This course starts with a rigorous study of object oriented design techniques and an introduction to current practices in Software Engineering. By the end of the course, students will participate in a group design project putting into practice what they have learned to date. Topics include Uniformed Modeling Language (UML), Object Oriented Design (OOD), theory and practice of software engineering, ethics in Computer Science and Software Engineering, Software Engineering tools, requirements elicitation, software-requirements specification, requirements review, software development, software-development life cycle, teams, and project management.

Upper-Division Writing:

This course has been approved as meeting the *Liberal Studies* requirements for **Upper-Division Writing** and thus is designed to help you become a flexible and proficient writer for professional purposes.

In order to fulfill FSU's Upper-Division Writing requirement, the student must earn a “C-” or higher in the course, and earn at least a “C-” average on the required writing assignments. If the student does not earn a “C-” average or better on the required writing assignments, the student will not earn an overall grade of “C-” or better in the course, no matter how well the student performs in the remaining portion of the course.

Scholarship-in-practice:

This course has been approved as meeting the *Liberal Studies* requirements for **Scholarship-in-practice** and thus is designed to help you become a critical thinker, a creative user of knowledge for professional practice, and an independent learner. In order to fulfill FSU's Scholarship-in-practice requirement, the student must earn a “C-” or better in the course.

Instructor:

Course Director and Instructor: Dr. David A. Gaitros

Office: Love 105D

Email: dgaitros@fsu.edu

Office Hours: TBD Usually Monday and Wednesday 1-3:30

Web Site: <http://www.cs.fsu.edu/~gaitrosd>

First Day Attendance:

Attendance will be taken during the first lecture of this class. Any student registered as of Monday of the first week of class and not present for the first lecture will be dropped from the class as per the guidance of the First Day Attendance policy of the University.

Overview:

The IEEE defines software engineering as "the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software". There are many competing approaches to solving every software engineering problem. A goal of this course sequence is for the students to become aware of a representative range of software development approaches, including the associated concepts, techniques, and terminology, and to learn some of the techniques in sufficient depth to apply them to projects in the course. Another goal is to improve the students' ability to work on a software development team, through experiences in course projects and reflection on those experiences. Quite a few of the concepts and techniques exposed in this course will be useful beyond the domain of software development, in virtually any human enterprise.

Prerequisites:

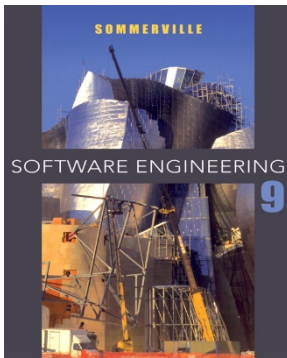
CEN4020 serves as one of the "capstones" of the computer science curriculum. As such, it requires students to demonstrate that they are able to apply a collection of skills that they should have learned in prior courses, including the co-requisite COP4530 (Data Structures, Algorithms, and Generic Programming) and its prerequisites. These skills include:

- Problem solving
- Object-oriented design
- Planning and organization
- Teamwork
- Written and oral communication practice on subjects in the field of computing
- The ability to use basic programming tools in MS Windows and Unix environments.

Text book:

Students will be required to have either the 9th or 10th edition of the Sommerville "Software Engineering" textbook.

Title: Software Engineering, 9th Edition or 10th Edition



9th Edition

Publication date: 2011

Publisher: Prentice Hall

ISBN 10: 0137035152

ISBN 13: 9780137035151



10th Edition

Publication Date: 2014

Publisher: Prentice Hall

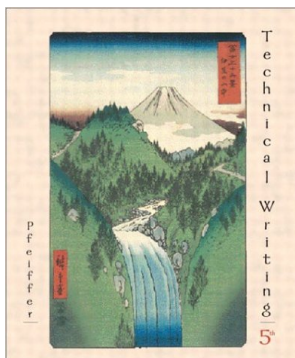
ISBN 13: 9780133943030 (978-0-13-394303-0)

ISBN: 0133943038 (0-13-394303-8)

Reference Material:

The following book is recommended but **not required**:

Title: Technical Writing, 5th Edition



5th Edition

Publication Date: 2003

Publisher: Prentice Hall

ISBN : 0130938912 (0-13-0938912-)

Course Objectives:

The approved specific educational objectives for this course are that each student will demonstrate that she/he is able to:

- Demonstrate mastery of the fundamentals of Object Oriented Design, including appropriate use of the following components of UML:
 - Use Case Diagrams
 - Class Diagrams
 - Sequence Diagrams
 - State diagrams
 - UML modeling tools
- Describe and put to use the principles of Project Organization
- Effectively communicate with team members on all aspects of a project
- Demonstrate the ability to produce an original software design and working product
- Demonstrate the ability to produce professional documentation through the draft, writing, editing, and revision of a Software Requirements Document in four parts. The document will satisfy the Upper Division Writing requirement by having the student:
 - Use appropriate evidence from multiple sources to illustrate how a chosen topic is relevant to a particular field. The student must show they have researched the particular functional area of software development and produce a bibliography in IEEE format.
 - Employ different resources (such as words, graphs, charts, and images) to compose in the field. The student shall produce, as part of the design, the appropriate Object Oriented Design models such as Use Case Diagrams, Class Diagrams, and Sequence Diagrams.
 - Compose as a process, including drafts, revision, and editing. The document shall be submitted in four phases: (1) Initial draft with a completed Section I, (2) Second Draft of Section II with an update of Section I, (3) a final draft of the remaining sections with completed Section I and II. (4) A final version of the document with all revisions included.
 - Convey ideas clearly, coherently, and effectively for a particular purpose, occasion, or audience as appropriate for the field. The student shall follow the technical writing guides as specified in the course.
- Create system designs and effectively present them in written documents
- Describe and use specific software design patterns
- Create object oriented design interfaces
- Define and effectively use the concepts of the software development process
- Define, implement, and use a software development project plan
- Define and investigate ethical issues in software development
- Recognize and use requirements engineering processes
- Define requirements using RUP workflows processes
- Specify requirements using the Unified Modeling Language
- Build and review supporting data dictionaries for UML

- Define functional and non-functional requirements
- Define and work using a team structure in a software development project

Scholarship-in-practice:

This course satisfies three (3) hours of the University's Liberal Studies Scholarship-in-practice requirement. During the term the students will be required to:

1. Work on, in a team environment simulating a work environment, on an original software product.
2. Develop a Software Requirements Specification and Design document that articulates software requirements analysis, design, and development process.
3. Design, write, and test a portion of the software product
4. Defend the project in an oral presentation
5. Develop a development plan to include a list of objectives and schedule for completion
6. Submit the plans and documents routinely over the course of the term for both faculty and peer review
7. Participate in the review and critique of other projects
8. Demonstrate the final product during class in a formal presentation to the instructor and other students

ABET Accreditation Requirements:

In order to satisfy the Computer Science accreditation requirements of [ABET](#) and [SACS](#), and the requirements of the State of Florida for [Academic Learning Compacts](#), this course has been chosen to assess the following additional student learning outcomes:

1. Demonstrate the ability to work in a team. During the course of the term students will be divided up into teams of 3 or 4 individuals to work on a requirements analysis document. The overall document will be graded as well as each individual member's contribution in peer reviews. The average of the two will constitute passing of this assessment.
2. Produce a Software Requirements Document. Each individual's contribution of the Software Requirements document will be assessed. This will be Homework #3.
3. Produce a Software Design and implement a prototype. This section will be the Software Prototype delivered by the team. Each student must submit their code as fulfillment of this requirement.

These outcomes will be assessed in specific assignments to be identified during the term. It is important to understand that students are required to obtain a passing score on all these outcomes in order to pass the course. **It is important to understand that in order to receive a passing grade of "C- "or better in this class you must receive a "C-" or better in the ABET portions of this class.**

Course Communication:

All course materials are available on the Blackboard Site (<http://campus.fsu.edu>) . There you will find this syllabus, lecture materials, help files, homework assignments, and other materials

available to the students. Announcements to students will be posted on the Blackboard site and emailed to all users including Teaching Assistants. The instructor of this course will use your FSUID (email account) to communicate. Be sure to read your email from this account every day or have it forwarded to an account that you review on a daily basis.

Assignments and Examinations:

Readings. You will be assigned readings in the textbook and on the Web. For the textbook readings, you should try to answer the review questions and attempt as many as you can of the exercises at the end of each chapter, to help you find out whether you have understood the material you have read.

Examinations. There will be two midterm examinations and a final examination. The exams are designed to evaluate the student's comprehension of material, rather than just memorization. Questions may include multiple choice, true false, essay, and examples of problems similar to homework and project deliverables. On exams, you will be responsible for all of the assigned readings, the sample quiz questions, (including those not actually on the quizzes), and the homework's and project deliverables up to the date of the examination. All examinations will be "closed book". That is, no books or reference materials or electronic devices will be allowed in the examination room.

If you know in advance of a reason you will not be able to take a scheduled examination within the scheduled window of time, you are responsible for making arrangements in advance with the instructor. If you make prior arrangements, or have a documented last-minute emergency conflict -- such as a medical emergency or your employer requires you to make an out-of-town trip -- the instructor will attempt to accommodate you. However, under no circumstances will a student be allowed to take an examination before the rest of the class. A make-up examination may have an entirely different format from the examination given in class, and may be an oral examination. If a student misses one midterm examination, the instructor may choose to compute the grade using final examination score in place of the missed midterm examination score.

Homework:

To assess the progress of student's homework will be periodically assigned that examines the students understanding of the topics presented in class. Homework will include design and analysis problems such as Use Case Diagrams, Class Diagrams, Sequence Diagrams, and State Transition charts. Students will also be organized into very small groups and given simple problem to analyze and solve.

On the team project, students work together to apply principles and techniques from the course, such as using the Unified Process and UML to produce IEEE Software Requirements Specifications (SRS) and a human-computer interface (HCI) design. The team project is designed to expose students to working in groups and the complexity of communications among multiple participants. For this reason, groups of no less than three (3) and no more than five (5) are required.

UML Modeling Tool:

The homework in this class must be done using a modern Unified Modeling Language tool. Unless you have access to a commercial tool already we recommend the Visual Paradigm for UML tool. The installation guide is located in the Reference Material on the Blackboard Site.

Quizzes:

At the end of each chapter the student will be required to take a quiz based upon the material. The quizzes will be compiled from a pool of questions and is intended to ensure that students do the reading assignments.

Teams:

The target size for a project team will be no less than three (3) students and no more than five (5). Students will have an introduction to working inside a team in this first class in software engineering in preparation of the second class. Teams will be given a project to analyze and prepare a basic requirements document, design and working prototype.

Teams will not only be assessed by the instructor but there will also be peer evaluations from other members of the team that you are part of.

Development Environment:

One of the important aspects of software engineering is making effective use of software tools. A great variety of commercial tools are available for all aspects and phases of the software development process, from project management to coding and debugging, and from requirements analysis through design, testing, and maintenance. A goal of this course is to make students aware of the range of software tools available, and for students to experience using a representative sample. The set of tools used this term is yet to be determined. If you have experience with, or are interested in using a specific tool set, please contact the instructor to discuss it.

How to Do Well in this Course:

Read each assigned reading at least once prior to the lectures and/or quizzes to which they apply. Use the review questions provided to check how well you understood.

Attend every class meeting. In class, ask questions if you have any point on which you feel unclear. Offer to answer any questions that the instructor poses to the class, whether the answer seems obvious or you are only able to make a guess. Don't be afraid to interrupt, or to expose ignorance. Just being engaged enough to ask questions is a positive thing. Speak up if you find something unclear, to have it repeated or explained in a different way.

On-line notes will be provided after most lectures. Reviewing them after class and before exams can be helpful. However, don't assume you can get by as well with just reading the book and on-line materials. History shows that students who often miss class or are late class fall behind the rest of the class.

The lecture notes are generally outlines of topics to be covered, with some illustrations and diagrams. The classroom discussions generally will go into more detail. They may also cover additional topics, if a student asks a question or brings up an interesting point. In some cases, the notes may go beyond what it is possible to cover within the time limit of the class, and you will

be expected to read the portion that was not covered; if you have questions on that portion, please ask them by e-mail to the instructor.

Work on the homework assignments and projects diligently. The individual homework assignments are designed to prepare you for the team assignments, and are selected to complement important topics in the textbook. Thus having a good grasp on the concepts and techniques covered by assignments will assist you when taking an exam. If you have questions about the class materials, review questions, or the project, send them by e-mail to the instructor, but first attend class and read your own e-mails, as the instructor will either cover in the next class or broadcast by e-mail the response to any question that appears likely to be of use to the entire class.

Exam Makeup Policy:

An exam missed without an acceptable excuse will be recorded as a grade of zero (0). The following are the only acceptable excuses:

- If submitted *prior to* the scheduled exam: Evidence from a University official that you will miss the exam due to University sanctioned travel or extracurricular activity
- A note from a physician, University dean, or parent indicating an illness or other extraordinary circumstance that prevented you from taking the exam
- An emergency of unexpected origin

All excuses must be submitted in writing, must be signed by the excusing authority, and must include complete contact information for the authority, including telephone numbers and address.

Missed exams with acceptable excuse will be made up.

Missed, and acceptably excused, final exams will result in the course grade of 'I' and must be made up in the first two weeks of the following semester.

Grades:

Grade assignments will be based upon the points earned on three tests, homework assignment, quizzes, and group project. Use the following tables to determine your grade:

Grade Assignment Table:

Grade	Lower Bound %	Upper Bound %
A	94%	100%
A-	90%	93.9%
B+	87%	89.9%
B	84%	86.9%
B-	80%	83.9%
C+	77%	79.9%
C	74%	76.9%
C-	70%	73.9%
D	60%	69.9%
F	0%	59.9%

Graded Material Weights:

Graded Work	Weight
Exam 1	15%
Exam 2	15%
Final Exam	20%
Group Project	15%
Average of Quizzes	15%
Average of Homework Assignments	20%
Upper Division Writing (At least C- on HW #2 1-4)	P/F
ABET - Teamwork Participation	P/F
ABET – Requirements Analysis	P/F
ABET – Software Development (Group Project Code)	P/F

Late Assignment Policy:

Late assignments will not be accepted without a valid written excuse as to why the person was unable to complete the assignment in a reasonable time. Assignments not turned in on time will receive a zero unless the student can provide written evidence of circumstances that prevented them from working on the assignment in a reasonable amount of time. Since assignments are made available to the students on the 1st day of class a crisis at the last moment will not excuse a late submission. However, all assignments must be turned in to obtain full credit for the course.

Grade of 'I' Policy:

The grade of 'I' is given to a student who, for circumstances beyond their control, missed the opportunity to cover course materials. Under the conditions stated by the University, the grade of 'I' means that a student is allowed the next semester of their enrollment to make up all remaining course materials. It does not allow a student the opportunity to hand in additional work or improve their grade on previous assignments. The grade of 'I' will be assigned only under the following exceptional circumstances:

- The final exam is missed with an accepted excuse for the absence. In this case, the final exam must be made up during the first two weeks of the following semester.
- Due to an extended illness or other extraordinary circumstance, with appropriate documentation, the student is unable to participate in class for an extended period. In this case, arrangements must be made to make up the missed portion of the course prior to the end of the next semester.

University Attendance Policy:

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy:

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>.)

Communication:

Success in the course depends heavily on students checking email and announcements posted on the class Web site. Most communication between teacher and student occurs online. Students are expected to check email, and announcements on the class Web site daily Monday - Friday. The class agenda and grade book should be checked at least once a week to stay current on what

needs to be done and what has been graded. Failure to do so may result in missed opportunities and poor grades.

Americans with Disabilities Act:

Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from the Student Disability Resource Center has been provided. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the: Student Disability Resource Center 874 Traditions Way 108 Student Services Building Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD) sdrc@admin.fsu.edu <http://www.disabilitycenter.fsu.edu>

Free Tutoring from FSU:

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options at <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy:

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.