Instructors: Dr. Ali H. Doğru, section 1  
Dr. Ebru Aydı̇n Göl, section 2  
Dr. Halit Oğuztüzün, section 3  

Assistants: Arınç Elhan, M. Çağrı Kaya  

Catalogue description: Software lifecycle processes, including specification, design,  
construction, testing and evolution. Software process models. Modeling of computer-based  
systems. Software quality assurance. Software engineering standards. Professional and  
ethical responsibilities of software engineers.  

Course learning outcomes: The students will gain an understanding of the foundations of  
the software engineering discipline for developing and maintaining computer-based systems.  
The students will be exposed to the life-cycle processes, modeling techniques, quality  
concepts, testing methods, standards, and ethical and professional responsibility.  

Prerequisite: CENG 213  
Background: Object-oriented programming.  

Textbook:  

References: UML resources, IEEE Software Engineering Standards, Software Engineering  
Code of Ethics and Professional Practice (SECEPP), World Intellectual Property  
Organization (WIPO) brochures on intellectual property rights (IPRs).  

Course Outline:  

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<th>Topic [Resource]</th>
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<td>Requirements Engineering [4,IEEE Std.]</td>
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<td>System Modeling [5, UML]</td>
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<td>Architectural Design [6,IEEE Std.], Project (SRS final delivery)</td>
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<td>Dependability [10,1-2,11,1-2,12,1-2,13,1-3], Project (SDD part-1 delivery)</td>
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<td>11 (3 h)</td>
<td>Quality [24,1-2], Project (SDD final delivery)</td>
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<td>Overview, Midterm-2</td>
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<td>14 (4 h)</td>
<td>Professional and Ethical Issues [SECEPP,WIPO]</td>
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Grading:
Midterm-1   17%
Midterm-2  17%
Project    30%
Class participation  6%
Final Exam  30%

You must get at least a total of 60 points (out of 200) from the midterm exams and submit both SRS and SDD in final form to obtain the right to sit for the final exam.

Software Engineering Project

This semester’s project topic is *FeederWatch*, a citizen science project about birds, managed by Cornell Lab of Ornithology and Bird Studies Canada. See [http://feederwatch.org/](http://feederwatch.org/)

Your work, consisting of requirements engineering and architecture design, must account for the functionality and the essential quality attributes of the FeederWatch software. In particular, data entry by the participants, processing of the data by the software and the project staff, and the production of data reports and analysis results are within the system scope.

Your SRS, compliant with ISO-IEC-IEEE 29148-2011, will specify the functional and non-functional requirements for the software for the FeederWatch project and related database operations, and your SDD, compliant with IEEE 1016-2009, will document your design of the architecture for the specified software.

Deliveries (both in two installments):
- Software requirements specification (SRS) (ISO-IEC-IEEE 29148-2011) [13%]
- Software design description (SDD) (IEEE 1016-2009) [17%]

Rules:
- You may work alone or with a partner.
- Delivery medium: Paper and COW (both).
- Diagramming standard is UML 2.0. Your UML diagrams should be importable by StarUML2.
- Software Engineering Code of Ethics and Professional Practice is to be observed.

Detailed Schedule

- Project (SRS part-1: SRS document including the system context and the use-case model only): March 20, 9:30
- Project (final SRS: full document): March 27, 9:30
- Midterm-1 (emphasis on process models, requirements eng.): April 6, 17:40
- Project (SDD part-1: SDD document including the composition view only): April 24, 9:30
- Project (final SDD: full document): May 2, 9:30
- Midterm-2 (emphasis on design, testing, dependability): May 11, 17:40
- Final Exam (comprehensive exam with many questions): date to be announced
Free Resources on the Web

Web page for the textbook:

Software Engineering Code of Ethics and Professional Practice:
http://www.acm.org/about/se-code
https://ethics.acm.org/

IEEE Standards:
http://ieeexplore.ieee.org/browse/standards/collection/ieee

UML 2.0 in a Nutshell, by Dan Pilone and Neil Pitman
http://proquestcombo.safaribooksonline.com/0596007957?uicode=metu

UML tutorials:
http://www.sparxsystems.com/uml-tutorial.html
http://www.tutorialspoint.com/uml/
http://edn.embarcadero.com/article/31863

StarUML:
http://staruml.sourceforge.net/en/

Design Patterns:
http://pages.cpsc.ucalgary.ca/~kremer/patterns/
https://sourcemaking.com/design_patterns

Agile Software Development:
http://agilemanifesto.org/
http://agilemethodology.org/

WIPO (World Intellectual Property Organization) page on basics of IP:

The Risks Digest, forum on risks to the public in computers and related systems:
http://catless.ncl.ac.uk/Risks/

Wide Variety of Topics:
http://proquestcombo.safaribooksonline.com/
http://blog.ieeesoftware.org/
https://www.youtube.com/
http://www.slideshare.net/
https://sourcemaking.com/

Dilbert, by Scott Adams:
http://www.dilbert.com/
Sommerville chapters

Although the current edition of Sommerville, edition 10, is officially our textbook, if you have the previous edition it will serve almost as well for our purposes.

Here is a rough correspondence of the covered chapters and sections:

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