

**COMP 302 (01) SOFTWARE ENGINEERING**

Fall 2020

**1. Course Information**

<b>Instructor:</b>	Attila Gürsoy, agursoy@ku.edu.tr
<b>KU Credits:</b>	3.00
<b>ECTS Credits:</b>	6.00
<b>Prerequisite(s):</b>	Prerequisite: COMP 132, COMP. 202 or consent of the instructor Prerequisite: COMP. 132 or consent of the instructor
<b>Class Location &amp; Meeting Times:</b>	- Monday, Wednesday, Friday 15:00-15:50
<b>PS (Yes/No):</b>	No
<b>DS (Yes/No):</b>	No
<b>Lab (Yes/No):</b>	Yes
<b>Language of Instruction:</b>	English
<b>Office Hours:</b>	
<b>Teaching Assistant(s):</b>	

	<b>E-Mail</b>	<b>Phone</b>	<b>Office - Office Hours</b>
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**2. Course Description**

Review of methods and tools used in software development. Object oriented design and open software architectures. Requirements analysis, design, implementation, testing, maintenance and management. Engineering applications.

**3. Course Overview**

This course assumes that you are familiar with object-oriented programming using Java. If you feel you have weaknesses in this area, for instance, if you scored a C or below in Comp 131, Comp 132, or Comp202, the first few weeks of the course are a good time to brush up on your skills. The class will build upon knowledge of these fundamentals and will emphasize object-oriented analysis and design, and good programming discipline. A software development project to be carried out in groups forms the backbone of the course. We will see a software product through the project lifecycle, from analyzing customers' requirements to design, modeling, implementation, and testing. We will have design reviews for each major phase of your project. There will be regular meetings with each project group and a final presentation for your product at the end of the semester.

**4. Course Learning Outcomes (CLOs):**

CLO #	Upon successful completion of this course, students will be able to...
1	develop an understanding of the key concerns and challenges of engineering a large software system
2	develop an understanding the issues of requirements, specifying, architecting and designing a software system in order to provide modularity, adaptability and maintainability.
3	analyze, design, and develop software using object-oriented analysis and design, and design patterns.
4	develop the teamwork management skills.

## 5. Assessment Methods

Method	Description	Weight %
Attendance	Class participation	6.00
Quiz	In class quizzes	24.00
Project	Term Project	70.00
<b>Total:</b>		100.00

## 6. Instructional Material and Learning Resources

- Head First Design Patterns
  - Author:** Freeman, Robson, Bates, Sierra
  - Material Type:** Other
  - Material Status:** Recommended
- Applying UML and Patterns, Edition: 3
  - Author:** Larman
  - Material Type:** Textbook
  - Material Status:** Required
- Active Use of Course Page on Blackboard: <https://ku.blackboard.com/>
- KOLT Tutoring: No Service Available

## 7. Course Schedule

Meeting Times	Subject
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## 8. Student Code of Conduct and Academic Grievance Procedure

[Student Code of Conduct](#)

[Statement on Academic Honesty with Emphasis on Plagiarism](#)

[Academic Grievance Procedure](#)

## 9. Course Policies

## 10. Other

**Required textbook:**

Applying UML and Patterns, Edition: 3E, Larman Pearson Education.

**Reading (recommended):**

- Head First Design Patterns, Freeman, Robson, Bates, Sierra O'Reilly.
- Program Development in Java: Abstraction, Specification, Liskov and Guttag Addison-Wesley.
- Object-Oriented Software Engineering, Bruegge&Dutoit
- Java Concurrency: <http://docs.oracle.com/javase/tutorial/essential/concurrency/>
- Refactoring: Improving the Design of Existing Code, Fowler
- More material will be added as lectures covered relating to Git, Agile, Testing, Advanced Java topics etc.

### Grading Policies

**Assessment: (Tentative, there could be up to +5 changes depending on the pandemic and remote teaching conditions).**

- Class Participation %6
- In class quizzes %24
- Group Project %70

**Class Participation:** Attendance will be taken in the synchronous class meetings (zoom). Some of the project discussions will be conducted in the class as well. You are expected to attend classes at least 70% to get full points. There will be no makeup for missed attendances beyond that.

70% 6 points, 60% 5 points, 50% 4 points, 40% 3 points, less than 40% 0 points.

2 points bonus for in class discussions (subject to the instructor's evaluation of class participation, useful participation in discussion forums...).

The participation for the synchronous sessions will be fetched from the zoom reports. The participation in interactive discussions during the class zoom meetings might be used also for student participation evaluation.

In addition to synchronous classes, we will be using **Discussion Board** of course blackboard site for anything related to the course. Subscribe to the discussion forums to be notified with email if someone posts or responds. **DO NOT send email**, answering emails in a timely manner is not guaranteed.

**In Class Quizzes:** There will be seven quizzes. The quizzes are closed-book exam and will be conducted on blackboard. The best 5 of 7 quizzes will be used. There will be no makeup for missed quizzes (i.e., you can miss up to two quizzes). The quiz date/time and quiz topics will be announced at least 3 days before the quiz.

**Final:** There is no final exam in this course. It is a project based course.

### Project organization and grading:

You are required to form project groups of size GROUP\_SIZE. GROUP\_SIZE is FIVE (or SIX will be decided in the class) students.

- If you are not part of a team by the third week of the semester, you will be put in a team randomly.
- Similarly, if you form of a team of size less than GROUP\_SIZE, you will get members (chosen randomly).
- During the semester, if some of your team members drop the course, the remaining members are still responsible for the work, no compensation will be given. Choose your team wisely.
- If the class size is not multiple of GROUP\_SIZE, some groups might have +/-1 members (randomly assigned if no team volunteers).

Group members are expected to take part in every aspect of the project, and your grade for each phase will be based on your contribution to the group's work. **If you fail the group project (i.e. score less than 60 out of 100 points), you will fail the class regardless of your grades on the midterm.**

The project requires the students to work together in a team from the beginning to the end. You should plan on committing your time and effort to the team work. Teams that do not work together but individually produce very poor results and score poorly! **Teamwork, teamwork, teamwork!** Keep this in mind. Make sure that you perform well in your team. The peer evaluations submitted by your peers will affect your project scores. Each negative point deducts from your teamwork score. The details of peer evaluation will be announced during the project.

- The weekly meetings will be graded based on the group work and individual contribution. The objection to weekly meeting grades must be done within a week after the grade is announced. No objections will be considered after that.
- Teams or team members should report to the instructor as soon as possible if there are problems in the team that will affect teamwork.
- The health report should be more than one week to be counted as an excuse for project weekly participation. Maximum **TWO** meetings will be excused for health reports.

**Weekly Project Meeting Schedule:** We will have around 10 meetings. Each meeting will be conducted with zoom involving all the group members and the TA. The meeting time will be scheduled so that every group member and the TA can meet at the same time. We try to schedule the meetings towards the end of the week. The meeting time **does not have to be during lab hours**. If no time can be found that fits all, it

has to be during the lab time.

We will schedule zoom meetings/breakout rooms for each group and the TA.

Your project will have **intermediate milestones with corresponding deadlines**. Work submitted late will receive no credit. **This is a strict policy**. If you can't complete the work by the deadline, reduce the scope of the work you have to do. You have to submit a coherent set of documents and/or software by the deadline even if it fulfills only part of the requirements for the deadline.

Further details of project administration, schedule and deadlines will be announced after the class roster is finalized.

**Tool tutorials:** Throughout the semester, you will need to use on software engineering and project management tools such as UML modeling tools, version management tools (GIT) and testing tools such as JUnit. Links to material on these tools will be available on the course web site. Please familiarize yourself with these tools as soon as possible.

Note: the grading weights midterms and the project is **tentative**, may change **slightly** depending on their relative difficulties.

#### **Tentative Schedule** (weekly)

- Introduction to software engineering and iterative development.
- Requirements analysis and capture. Use cases, UML use-case diagrams. Non-functional requirements. Domain models and UML.
- Sequence diagrams. Operation contracts. UML class, object, and interaction diagrams.
- Architectural Design.
- Objects with responsibilities. GRASP design patterns.
- GRASP: Polymorphism, Pure Fabrication, Indirection, Protected Variation. GoF Design Patterns.
- GoF Design Patterns: Adapter, Factory, Singleton
- GoF Strategy, Composite, Facade, Observer.
- Concurrent/Multithreaded Programming in Java
- Concurrent/Multithreaded Programming in Java, Activity Diagrams, State Diagrams.
- Data abstraction, Type hierarchies, polymorphic abstraction, Specification.
- Specification, testing and verification. Test-driven development, Unit testing, Refactoring.
- More on GoF patterns.
- Term Project discussions.
- Term Project demos.

Last Update : October 16, 2020