CSE 3311. Object-Oriented Software Engineering, Spring 2019

1 General

Lectures:	TuTh 3:30pm — 4:50pm, COBA152
Instructor:	David C. Kung, ERB 532, 817-272-3785/-3784(fax)
Office Hours:	2:30PM-3:30PM Tuesday and Thursday, or by appointment
Email:	kung at uta dot edu
GTA:	TBD
GTA Office Hours:	TBD
GTA Email:	TBD

2 Course Objective

CSE 3311. OBJECT-ORIENTED SOFTWARE ENGINEERING. 3 Hours.

Study of an agile unified methodology and its application to object-oriented software development. Topics include requirements acquisition, use case derivation, modeling and design of interaction behavior and state behavior, introduction to design patterns, derivation of design class diagrams, implementation considerations and deployment. Team project. Prerequisite: C or better in each of the following: CSE 2320 and CSE 3310.

3 Reference Books

Ref 1. David Kung, "Object-Oriented Software Engineering: An Agile Unified Methodology," McGraw-Hill Higher Education, 2013. **ISBN: 978-0073376257**.

Ref 2. G. Booch, J. Rumbaugh and I. Jacobson, "The Unified Modeling Language User Guide," 2nd Ed., Addison Wesley, 2017.

Ref 3. Craig Larman, "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development" (3rd Edition), Prentice Hall, 2004.

4 Tentative Schedule

See Table 1 on next page.

Table 1: Tentative schedule

Date	Reading	Class Activity	Assignment (due date)
15-Jan 17-Jan	Ref 1 Ch 2	Policy & overview, background survey. Introduction & agile methodology. Teams formed by instructor & TA.	Background survey (1/15)
22-Jan 24-Jan	Ref 1 Ch 4	Semester team project. Requirements acquisition & specification.	Project requirements specification (1/29).
Iteration 1: 1/29-3/7			
29-Jan ***31-Jan***	Ref 1 Ch 5	Domain modeling, class diagram.	Brainstorming & classification sheets, domain model class diagram (2/5).
5-Feb 7-Feb	Ref 1 Ch 7	Deriving use cases from requirements, use case diagrams.	Use case brainstorming sheet, abstract and high-level use cases, use case diagrams (2/12).
12-Feb 14-Feb	Ref 1 Ch 8 & 9	Actor-system interaction modeling. Object interaction modeling.	Expanded use cases for selected use cases, to be determined in class (2/19).
19-Feb 21-Feb	Ref 1 Ch 9	Object interaction modeling. Sequence diagram.	**Individual homework 1 (3/19).** Scenarios, scenario tables, informal and design sequence diagrams for selected use cases (2/28).
26-Feb 28-Feb	Ref 1 Ch 11	Deriving Design Class Diagram (DCD). Reserved.	
5-Mar 7-Mar		Reserved. Iteration 1 due. No class. Teams are required to work together, and revise the weekly submissions and produce an integrated iteration 1 analysis and design report.	**Iteration 1 due today. See Section 5.1 for detail.**
12-Mar 14-Mar		*** SPRING BREAK ***	
19-Mar 21-Mar		Reserved. Midterm exam.	**Homework 2 (4/18).**
Iteration 2: 3/26-4/25 (no weekly submissions for iteration 2)			
26-Mar 28-Mar	Ref 1 Ch 10	Iteration 2 use cases. Controller pattern.	Iteration 2, see Section 5.2 for detail.
2-Apr 4-Apr	Ref 1 Ch 10	Expert pattern and creator pattern. Reserved.	
9-Apr 11-Apr	Ref 1 Ch 18	Implementation considerations. Test driven development.	
16-Apr 18-Apr	Ref 1 Ch 13	Object state modeling and state pattern (May leave to 4361).	
23-Apr 25-Apr		Reserved. Iteration 2 due. No class. Teams are required to produce an integrated iteration 2 analysis and design report.	**Iteration 2 report due, see Section 5.2 for detail.**
30-Apr 2-May		Review for final exam. Reserved.	
3-May		*** Last day of classes ***	
9-May		Comprehensive final exam, Thursday 2:00pm-4:30pm	

5 Workload

Work	Quantity	Weight	Subtotal
Semester team project	1	30%	30%
Individual assignment	2	15%	30%
Midterm exam	1	10	10 %
Final exam	1	20%	20%
Pop quizzes	N	10%/N	10%
Total			100%

- One semester-long team project with two iterations (30%). The project deliverables include the following items:
  - *Iteration 1 weekly team submissions (5%).*
  - *Iteration 1 integrated analysis and design document (10%).* See Section 5.1 for detail.
  - *Iteration 2 analysis and design document (15%).* See Section 5.2 for detail.
- Two individual homework assignments, 15% each. These are also used as ABET assessments of student outcomes e, c and k for the SE degree. These outcomes evaluate students' abilities to formulate a solution to an engineering problem, design a system/component to solve the engineering problem, and use tools and techniques (see below for more detail).

  Keep your homework confidential and do not share it with anybody. Academic dishonesty will result in zero point and academic discipline.
- One midterm exam (10%) and one comprehensive final exam (20%). These are open book tests, not open note. Each has a number of questions, and requires the student to *CIRCLE* the *BEST ANSWER*, not just the correct answer, from 4 choices. No electronic devices are permitted in the exam.
- Pop quizzes 10%. There will be a number of equal-weight pop quizzes. The exact number of pop quizzes is unknown in advance. A pop quiz can take place any time during the class and on any class day. *No make-up quiz will be granted unless you inform/email the instructor beforehand of any event that prevents you from attending the class. In case of sickness, the student is required to present a doctor's letter as a proof. In these cases, a make-up pop quiz will be arranged.*

5.1 Iteration 1 Submission

The iteration 1 integrated analysis and design document is produced by revising the weekly team submissions according to the feedback provided. It must contain the following sections, whichever is applicable:

- Title page: document title, list of team members, organization and date produced.
- A brief project description.
- Requirements specification (only functional requirements are required).

- Domain modeling, including:
  Business description (see Ref. 1 Figure 5.18)
  Brainstorming worksheet (see Ref. 1 Figure 5.18)
  Classification worksheet (see Ref. 1 Figure 5.19)
  A domain model class diagram (DMCD). See Ref. 1 Figure 5.20.

  There should be only one DMCD for both iteration 1 and iteration 2 use cases. NOT ONE DMCD FOR EACH USE CASE. The DMCD for iteration 2 use cases is an extension of iteration 1 domain model with additional classes, attributes and relationships.

- Use case modeling, including:
  Use case derivation worksheet (see Ref. 1 Figure 7.3)
  A list of numbered abstract use cases, each with its actors and system/subsystem, as well as its high-level use case. See Ref. 1 Example 7.6-7.8.
  Use case diagrams, each must include system/subsystem name and boundary, use cases, actors and association between use cases and actors. See Ref. 1 Figure 7.17.

- Actor-system interaction modeling, including:
  Expanded use cases for selected use cases for iteration i, i=1, 2. See Figure 8.1 but drop the UML notes.

  The selected use cases shall be determined in class on after weekly submission of abstract and high-level use cases and use case diagrams.

- Object-interaction modeling, including for each nontrivial step of each expanded use case selected for iteration 1:
  Scenario description (see Ref. 1 Example 9.4)
  Scenario table (see Ref. 1 Example 9.5)
  Informal sequence diagram (see Ref. 1 Figure 9.20)
  Design sequence diagram (see Ref. 1 Figure 9.21)

- Design class diagram (DCD). See Ref. 1 Figure 11.10. There should be only one DCD for both iteration 1 and iteration 2. The iteration 2 DCD is an extension of the iteration 1 DCD by adding classes, attributes, operations and relationships to the iteration 1 DCD.

5.2 Iteration 2 Submission

Iteration 2 submission is similar to iteration 1 submission except the following:

1. Iteration 2 submission must include new use cases selected for iteration 2 work.
2. Extend and/or modify DMCD to include domain classes, attributes and relationships relevant and important to the iteration 2 use cases if they are not in the iteration 1 DMCD.
3. Modify the list of abstract and high-level use cases to include the iteration 2 use cases.
4. Create expanded use cases for the iteration 2 use cases.
5. Modify iteration 1 scenarios, scenario tables, informal and design sequence diagrams to apply the controller, expert and creator patterns.

6. Produce scenarios, scenario tables, informal and design sequence diagrams for iteration 2 use cases with the controller, expert and creator patterns applied.

7. Since the iteration 1 design sequence diagrams are changed and new design sequence diagrams are produced, therefore, derive a new DCD from all of the iteration 1 and iteration 2 design sequence diagrams.

6 Homework/Project Submission

1. Submit individual homework, project weekly submissions, and iteration 1 & 2 submissions according to instructions given by the TA. Files must be prepared and named according to homework description; points will be deducted if these are not followed.

2. For all homework and project submissions, 10% will be deducted for each late submission.

7 About Teamwork

Team members are required to WORK TOGETHER THROUGHOUT THE PROJECT — that is, WORK TOGETHER FROM BEGIN TO END. You should plan on committing your time and effort to team work. Teams that do not work together produce very poor results and receive very poor scores! Teamwork, teamwork, teamwork! Keep this in mind.

Make sure that you perform well in your team. The peer evaluations form (see Table 15) submitted by your peers will affect your project scores. Each negative point, i.e., "-1", deducts 1% from your teamwork score. For example, if your team gets 90 for iteration 1, and you receive five "-2" from your peer evaluations, then your score drops to 80.

Teams or team members should report to the instructor **AS SOON AS POSSIBLE** if there are problems in the team that will affect teamwork.

8 Grade Distribution

Total Score	>= 85	>= 70	>= 60	>= 50	< 50
Grade	A	B	C	D	F

The grades are computed by a program according to your scores. Even if you get 84.99 your grade will be a "B", not an "A" though it is so close to 85.

9 General Grading Criteria

The homework assignments are required to satisfy the Accreditation Board of Engineering and Technology (ABET) outcomes (c), (e) and (k):

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(e) an ability to identify, formulate, and solve engineering problems

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The homework assignments are evaluated according to the following rubrics:

Level L5. 100-90 points. Proposed solution significantly exceeds expectation, the solution is well-organized and clearly formulated, needed assumptions are clearly stated.

Level L4. 89-80 points. Proposed solution is adequate and valid, the solution is organized and adequately described, assumptions are stated.

Level L3. 79-70 points. Proposed solution is somewhat adequate and valid, the solution is somewhat organized and partially described, important assumptions are stated.

Level L2. 69-60 points. Proposed solution is only marginally adequate or valid, the solution is poorly organized or difficult to understand, important assumptions are not stated.

Level L1. 59-0 points. Proposed solution is incorrect or far from adequate and valid, the solution is impossible to comprehend.

10 Project Grading Criteria

The team project is evaluated each increment using an evaluation sheet similar to the one shown in Table 10. The weights shown in the figure will be changed slightly later. Pay attention to the weights given to the different categories of items. If your presentation and/or documentation misses an item, then the item will receive zero point. Teamwork means team members should check the team submissions before submitting them. Missing items and late submissions happen all the time in previous semesters!

11 Assignment Rules

1. Late submissions are subjected to 10% deduction.
2. You are encouraged to discuss homework with your classmates but not allowed to copy the solutions from or share the solutions with anybody. If you violate this rule, then you will receive no credit for that assignment unless you can prove that you are not involved.
3. The GTA will do most of the grading. If you do not agree with the result, contact the GTA first. Please contact the instructor if you cannot reach a consensus. This would help the GTA improve her/his grading skill and avoid inconsistency due to improper interference of the instructor.
4. No additional make-up assignment will be provided for any student to improve grade.

CSE 3311 Project Increment Evaluation Sheet														
Team #														
			Level 5			Level 4		Level 3		Level 2:		Level 1		
			High quality work that exceeds expectation			Clearly high quality work		Major comps present, good work		Major comps missing, poor work		Many comps missing, very poor work		
Submission	%		100	95	90	85	80	75	70	65	60	40	20	0
Requirements	**5**													
Use Case Modeling	**20**													
Abstract/High-Level Use Cases		5												
Expanded Use Cases		10												
Use Case Diagram		5												
Domain Modeling	**30**													
Brainstorm & classification		15												
DM Class Diagram		15												
Object Interaction Modeling	**30**													
Scenarios/Scenario Tables		15												
Sequence Diagrams		15												
Design Class Diagram	**15**													
Total	**100**													

Table 2: Sample project evaluation sheet

12 Go Home Early Request

Requests for permission to go home before the final exam date will not be granted except for medical reasons and with a proof from a doctor.

13 Class Email Alias

I will broadcast important messages, homework assignments, project descriptions etc. to students of the class. The messages will be delivered to your UTA email account. If you do not receive such messages, please contact me immediately so that I can add you to the list. If you drop the course or your email address has changed, please inform me so I can update the emailing list.

14 Your Standing and Class Statistics

The GTA will be responsible for uploading your scores to the blackboard and publish class statistics so you will know your standing in the class. Please remind the GTA and the instructor to do so if this does not happen in due time.

15 Team Member Peer Evaluation Form

Your teamwork performance is an important part of this course. At end of each increment, each student is required to submit his team member evaluation form, which requests the student to evaluates the performance of other team members. Each submission is 1% (if there are three increments, then the total is 3% for the semester). Only hard copies of the evaluation form are accepted. Submit the form on the last day of the increment presentation.

Project Team Member Evaluation Form

Team#___ Iteration#____ Course#_____ Fall / Spring Year_____

Please submit hardcopy or fax to David Kung 817-272-3784, EMAIL NOT ACCEPTABLE

Most team members perform well in a project team. However some members perform extremely well and some very poorly. It is constructive to encourage the outstanding members and inform those who need improvements. This form allows you to convey such information to your team members whenever you deem there is such a need.

Please give an integer rating of -2 (poor), -1 (below average), 0 (average), +1 (above average), or +2 (excellent) for some of the aspects of the members you want to convey your assessment. Your evaluation might be reproduced (to hide your identity) and presented to the relevant members. However, the identity of the evaluator will be kept absolutely confidential in all cases.

Member name					
Group meeting attendance					
Group discussion					
Individual assignment					
Technical contribution					
Organizational contribution					
Overall performance					

Comments: (use additional sheets if needed)

Name: _____ Signature: _____ Date: _____

Please fill the course info, read, sign and return this statement to the instructor. Thanks.

Statement of Ethics
Student Confirmation
(CSE_____, Spring [], Summer [], Fall [], Year of _____)

The following is an excerpt from the College of Engineering's statement on Ethics, Professionalism, and Con-duct of Engineering Students. The notes are modifications appropriate for Computer Science and Engineering courses. Read the statement carefully, sign it, and return it to your instructor. A copy of the original policy is available for examination in the Computer Science and Engineering office. Additional copies of this statement can be obtained from your instructor or the Computer Science and Engineering office.

Statement on Ethics, Professionalism, and Conduct of Engineering Students
College of Engineering, The University of Texas at Arlington

The College cannot and will not tolerate any form of academic dishonesty by its students. This includes, but is not limited to 1) cheating on examination, 2) plagiarism, or 3) collusion.

Definitions:
A. Cheating on an examination includes:
1. Copying from another's paper, any means of communication with another during an examination, giving aid to or receiving aid from another during an examination;
2. Using any material during an examination that is unauthorized by the proctor;
3. Taking or attempting to take an examination for another student or allowing another student to take or attempt to take an examination for oneself.
4. Using, obtaining, or attempting to obtain by any means the whole or any part of an unadministered examination.
B. Plagiarism is the unacknowledged incorporation of another's work into work which the student offers for credit.
C. Collusion is the unauthorized collaboration of another in preparing work that a student offers for credit.
D. Other types of academic dishonesty include using other student's printouts from the ACS labs or students' disk, etc.

Notes:
1. The use of the source code of another person's program, even temporarily, is considered plagiarism.
2. Allowing another person to use your source code, even temporarily, is considered collusion.
3. In this class, the specific exceptions given below are not considered scholastically dishonest acts:
A. Discussion of the algorithm and general programming techniques used to solve a problem
B. Giving and receiving aid in debugging
C. Discussion and comparison of program output
4. The penalty assessed for cheating on a given assignment will be twice the weight of the assignment and will include notification of the proper authorities as stipulated in the UTA Handbook of Operating Procedures and on the web at http://www2.uta.edu/discipline
5. You may be entitled to know what information UT Arlington (UTA) collects concerning you. You may review and have UTA correct this information according to procedures set forth in UT System BPM #32. The law is found in sections 552.021, 552.023 and 559.004 of the Texas Government Code.

I have read and I understand the above statement.

Student's signature:_____

Student's name (printed):_____

Student's ID number:_____