Carnegie Mellon
HeinzCollege

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<tr><td>Course Information</td><td>Course Title: 95706 Object Oriented Analysis and Design
Class Day/Time/Location: Tue, Thu. 3.10-4:30 pm (HBH 1202 / Zoom)
Instructor: Neelam Dwivedi
Office Hours: Please refer to Canvas home page</td></tr>
<tr><td>Prerequisites</td><td>95-712 Object Oriented Programming in Java</td></tr>
<tr><td>Description</td><td>Large-scale software development has been described as one of the most difficult of human undertakings. This course examines the reasons for the inherent complexity of software construction, and presents structured methods to deal effectively with it. The course will focus on the object-oriented approach for analysis and design. Students will gain an appreciation of the difference between writing programs and doing analysis and design. Problem formulation and decomposition (analysis) and solution building (design) will be covered. Students will work in small groups, each group having the responsibility for analysis, design and implementation of a software system. Case tools will be used in several stages of the development process.

Knowledge of an Object-Oriented language such as Java or C++ is a pre-requisite for this course.</td></tr>
<tr><td>Course Materials</td><td>References:
Software Requirements by Karl E. Weigers. 2013. 3rd ed
Applying UML and Patterns by Craig Larman. 2004. 3rd ed
The Rational Unified Process by Krutchen. 2004. 3rd ed
Design Patterns: Elements of Reusable Object-Oriented Software. Gamma, Helm, Johnson, Vlissides. 1995. Addison Wesley
http://www.utm.mx/~caff/doc/OpenUPWeb/index.htm
Software:
MS-Visio (https://www.cmu.edu/computing/software/all/msimagine/) / Visual Paradigm http://www.visual-paradigm.com/download/community.jsp / PlantUML www.plantuml.com</td></tr>
<tr><td>Evaluation Method</td><td>The final grade will be out of 200 points. The grading breakdown is listed below. A detailed description of each of these activities is given on the next page.

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<tr><th>Activity</th><th>Distribution</th><th>Points</th><th>%</th></tr>
<tr><td>Weekly self-assessments</td><td>4 points per week for 8 weeks</td><td>32</td><td>16%</td></tr>
<tr><td>Weekly feedback survey</td><td>1 point per week for 8 weeks</td><td>8</td><td>4%</td></tr>
<tr><td>Team Project</td><td>3 deliverables of 15 points each</td><td>45</td><td>22.5%</td></tr>
<tr><td>Project presentation</td><td>3 presentations of 10 points each</td><td>30</td><td>15%</td></tr>
<tr><td>Project peer rating</td><td>5 points per deliverable</td><td>15</td><td>7.5%</td></tr>
<tr><td>Case Studies</td><td>3 case studies for 20 points each (lowest dropped)</td><td>40</td><td>20%</td></tr>
<tr><td>Quiz</td><td>3 quizzes of 10 points each</td><td>30</td><td>15%</td></tr>
<tr><td>Total</td><td></td><td>200</td><td></td></tr>
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<tr><td>Learning / Course Objectives</td><td>Develop a working understanding of formal object-oriented analysis and design processes
Develop an appreciation for and understanding of the risks inherent to large-scale software development
Learn (through experience!) techniques, processes, and artifacts that can mitigate these risks
Develop the skills to determine which processes and OOAD techniques should be applied to a</td></tr>
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<tr><td></td><td>given project, and
• Develop an understanding of the application of OOAD practices from a software project management perspective</td></tr>
<tr><td>Grading Scale</td><td>A+ 97-100% B+ 87 - 89% C+ 77 - 79%
A 93 – 96% B 83 - 86% C 73 - 76%
A- 90 - 92% B- 80 - 82% C- 70 - 72%</td></tr>
<tr><td>Course Policies & Expectations</td><td>Graded activities

1. Weekly self-assessments (SA) and surveys:There is a significant part of course-content provided in the form of videos that you are expected to watch each week. You are expected to perform two graded activities after watching each week's videos before Sunday midnight.
a. Complete weekly self-assessments based on the video-content for which you will get two attempts. The higher of the two scores will be considered for grading.
b. Take the survey for 'muddiest' topic / question you would like me to discuss in class and provide your feedback on the video-content.
2. Team Project: You will be assigned a project based on a real world problem. You will work in a team to progressively build the OOAD artifacts for this project as per the Unified Process. The project activities will be graded along four activites
i. Three deliverables of your OOAD model (See Project document for details)
ii. 10-minute team presentations in class for each of the deliverables submitted.
iii. Peer-rating by your team members in a survey administered after each deliverable is submitted. This will account for your individual project participation score
iv. You will also provide feedback to your peer-teams as they present their models in class
3. Case Studies: There will be three case studies assigned to you through the course. Top two scores will be considered for final grading. You will be assigned some activity related to the case study that needs to be completed before the due date. The specifics will vary with each case study, and will be a combination of
i. Answers to the question to be submitted individually
ii. Group discussions / presentations in class
4. Class Quizzes: There will be three quizzes based on the topics covered in the previous weeks. All quizzes have to be taken in-person in the class. Trying to take the quiz remotely without instructor's prior permission will be considered as an integrity violation. No make-up quizzes will be allowed unless there is an unavoidable emergency supported by a documented evidence. Job interviews do not count as an emergency.
5. Class Absence: Any absence in class for case-study will be taken as the lowest score and will be dropped. Absence from team presentations must be approved by your team.

Grades: Grade disputes, if any, must be reported to the TA or the instructor within one week from the day of grade-distribution. Copying from any source without citation, sharing your work with other students, or copying from other students will be considered as cheating and plagiarism and will be addressed according to the university policies http://www.cmu.edu/academic-integrity/. You are responsible for being familiar with the university standard for academic honesty and plagiarism. Please see the CMU Student Handbook for information. In order to deter and detect plagiarism, online tools and other resources are used in this class.</td></tr>
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Course Schedule / Topical Outline: (Subject to change as needed)

Wk#. Dates	Topic (Reference)	Planned activity
1. 23, 25 Mar	Software Development Methodologies (Krutchen Chapters. 1,2,5)	• Getting ready! • Class discussion
2. 30 Mar, 1 Apr	Requirements Eliciation (Weiger Chapters 5 to 17)	• Project Kickoff • Requirement elicitation
3. 6, 8 Apr	Requirements Analysis (Larman Chapter 9, 13, 15, 16)	• Class discussion ---------- • Case study1
4. 13, 15 Apr	OOAD and UML (Larman Chapter 9, 13, 15, 16)	• Class discussion • Class quiz 1 ---------- • Project presentation 1
5. 20, 22 Apr	Design patterns and principles (Gamma et al)	• Class discussion ---------- • Case study 2
6. 27, 29 Apr	Design patterns and principles	• Class discussion • Class quiz 2 ---------- • Project presentation 2
7. 4, 6 May	Test driven development	• Class discussion ---------- • Case study 3
Wrap up + Final quiz, project presentation	OO Metrics and wrapup (CK Metrics)	• Class discussion • Class quiz 3 ---------- • Project presentation 3

Students with Disabilities:
Our community values diversity and seeks to promote meaningful access to educational opportunities for all students. CMU and your instructors are committed to your success and to supporting Section 504 of the Rehabilitation Act of 1973 as amended and the Americans with Disabilities Act (1990). This means that in general no individual who is otherwise qualified shall be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity, solely by reason of having a disability.

If you believe that you need accommodations for a disability, please contact us ASAP, and we will work together to ensure that you have the correct access to resources on campus to assist you through your coursework and time at CMU.

Academic Integrity:
Carnegie Mellon University sets high standards for academic integrity. Those standards are supported and enforced by students, including those who serve as academic integrity hearing panel members and hearing officers. The presumptive sanction for a first offense is course failure, accompanied by the transcript notation "Violation of the Academic Integrity Policy." The standard sanction for a first offense by graduate students is suspension or expulsion. Please see http://www.cmu.edu/academic-integrity/ for any questions.

Cell Phones, Smartphones and other handheld wireless devices:
Other than during class breaks, please silence ring tones and refrain from engaging in calls, messaging or other use during class time. All devices must not be visible in any way during exams.

Policy Regarding Students Using English as a Foreign Language:
Assignments in this course are graded with reference to evidence of the acquisition of concepts, presentation format, and accuracy of information. Having done business in countries that use languages other than English, we understand that the use of an unfamiliar language can result in unusual word choices or grammatical errors that are not critical to the overall understanding of the information. Therefore, we will take into account your need to function in a language that may be unfamiliar to you. We will provide feedback as appropriate if we feel that language or grammar you have used in assignments would be best if it were configured in a different way.

Use of Canvas System for this course:
The Heinz School uses Carnegie Mellon University's Canvas system to facilitate distance learning as well as to enhance main campus courses. In this course, we will use the Canvas system generally to post lecture notes and related documents and to receive assignments electronically from students. To access Canvas go to https://cmu.instructure.com/

Take care of yourself. *Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.*

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit their website at http://www.cmu.edu/counseling/. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.