EN.605. 704 section 81

Object-Oriented Analysis and Design

Course Information

Object-Oriented Analysis and Design

EN.605. 704 81 (3.0 Credits)
Summer 2022 [AE Summer 2022]

Description

This course describes fundamental principles of object-oriented modeling, requirements development, analysis, and design. Topics include specification of software requirements; object-oriented static and dynamic analysis approaches using the Unified Modeling Language (UML); object-oriented design; object-oriented reuse and maintainability, including design patterns; software implementation concerns; state models; persistence; and the Object Constraint Language (OCL). Prerequisite(s): While there are no programming assignments in this course, experience in an object-oriented programming language such as C++ or Java is important.

Department: PE Computer Science
College: Engineering and Applied Science Programs for Professionals

Instructors

Sam Schappelle
sschapp1@jhu.edu

Joseph Demasco
jdemasc1@jhu.edu

Communication Policy:

If you need to communicate privately with the instructors, you may use e-mail. Canvas has an e-mail facility. If you use that, the course and section numbers will appear automatically in the subject line of your note. If you use another e-mail facility, please put the course number and section number in the subject line. We use the course and section number to organize our e-mail inboxes. We are all teaching multiple courses and sections this semester, so this will help us keep our communication organized. We check our e-mail frequently, and you can usually expect a response within a day.

If you need a more immediate response, you can send us an SMS text message or call on the telephone. Here is our contact information:

Sam Schappelle Phone: 301-963-0764, Cell/Text: 240-338-3862, E-mail: sschapp1@jhu.edu

Joe Demasco Phone: 301-873-0771, Cell/text: 301-873-0771, E-mail: jdemasc1@jhu.edu

From time to time the instructors will communicate with you via the Announcement mechanism in Canvas. Be sure to monitor the Canvas website regularly so you don't miss important announcements. We expect that you will log in at least once a day. Be sure to check the Office Hours forum each time you log in.

Office Hours:

Office hours will be held both asynchronously via Canvas and synchronously via Zoom. There will be an "Office Hours" forum in the discussion forums on Canvas. When you post a question or comment here, everyone in the class (other students, as well as the instructors) can see it and post a response. You can expect a response to your post within a day. Please feel free to submit an answer to any question asked by another student if you feel you can help.

We will also be providing synchronous office hours one evening each week. We will post an announcement with details of how to participate.

For more information regarding Zoom, please see the Zoom Student Quick Start Guide.

Course Structure:

The course content is divided into modules. Modules can be accessed by clicking Course Content on the menu. A module will have several sections including the overview, content, readings, discussions, quizzes and assignments. You are encouraged to preview all sections of the module before starting. Most modules run for a period of nine (9) days, exceptions are noted on the Course Outline page. You should regularly check the Calendar and Announcements for any changes to assignment due dates.

Course Topics:

- Introduction to OOAD
- Requirements Elicitation
- Capturing Functional Requirements with Use Cases
- Writing Use Case Scenarios
- Use Case Diagrams and Documentation
- Finding Candidate Classes
- Static Analysis Modeling
- Dynamic Analysis Modeling
- Static Design Modeling
- Dynamic Design Modeling
- State Modeling
- Design Patterns
- Object Constraint Language
- Persistence

Course Goals:

This course will prepare you to apply object-oriented techniques and notation to the process of developing software. You will be able to perform the following activities: develop requirements, analyze the requirements using object-oriented analysis to identify the software components to be implemented, and design those software components using object-oriented design techniques. The notation of the Unified Modeling Language (UML) will be used throughout

Course Learning Outcomes (CLOs):

Create, Critique and Refine customer Use Cases

- Transform Use Cases into Object Oriented software Realizations through OO Analysis and OO Design
- Document your requirements, analysis, and design models in the Unified Modeling Language (UML) notation
- Apply techniques of state machines, design patterns, persistence, and the Object Constraint Language (OCL) to your designs

Required Text and Other Materials

Textbooks:

No textbook is required for this course. Most of the information that you will need can be obtained from on-line resources. From time to time we may suggest additional sources.

Access to textbooks via the JHU Libraries:

EP students may access electronic versions of textbooks through the Sheridan Libraries. Instructions on how to search for available textbooks are accessible through this link: Browse Electronic Textbook Instructions

Technical Requirements:

You should refer to General Technical Requirements for guidance on system requirements. Access suport resources from the **Help** menu if you encounter any technical issues.

Evaluation and Grading

Student Coursework Requirements:

It is expected that each class will take approximately eight hours per week to complete. Here is an approximate weekly breakdown: Watching the video lectures (approximately one hour), doing additional background research and participating in office hours (approximately one hour), working on the team project (five to seven hours).

Each module will have a quiz. The quizzes are based on the information presented in the video lectures. You will be allowed up to two attempts to take each quiz. If you take a quiz twice, the two scores are averaged together. All quizzes carry the same weight, regardless of the number of questions. Quizzes constitute 40% of your final average.

There is a semester long project associated with this course. The project is described in a separate document, *The Team Project* (in the same section of Canvas where you found this syllabus). Most of the modules will have related project assignments. The project activities are performed in teams. The ideal team size is three people. Teams are self-selected during the first week of the class. We intend that every member of the class will contribute a fair share to the

team's efforts on the project. Thus, all team members will share the same grade for each assignment. To ensure that all team members are participating equally in the project, we will ask for feedback from your teammates. The peer review rubric can be found in the team project description (on the menu in Canvas). The peer review will count as part of your project grade.

There are no requirements to participate in discussion forums. You will be graded entirely on the application of what you learn in the video lectures to the team project and the quizzes. There are deliverables you will be asked to produce and turn in associated with most of the modules. We will discuss how to apply the techniques for creating them in the various modules of the course.

For each module, you will have one week to view the lectures and take the quiz. You will then have another several days to complete the deliverables for that module (while viewing the videos for the next module). The due dates for the deliverables and quizzes are shown on the course outline as well as in the calendar.

You will be using the discussion tool in Canvas to turn in your project documents. There is a discussion forum for each deliverable in the project. The instructions for turning in the document are in each forum. You will use the same forum for making comments on the documents submitted by the other teams. If you want to update the documents, you can also do that by editing the original append and adding the link to the new version. Keep the links to the older versions there, too, as sort of a version history.

We would like to encourage you to review the work produced by the other teams. Both you and the other teams will benefit from these reviews. You will benefit because you may learn things from the other teams that your team may have missed or got wrong. You will benefit from the comments from the other teams because they can help find defects. As we know, it is sometimes quite difficult for us to find our own defects, but it is easier for others to spot them.

While each project deliverable is submitted only once for a grade, you may want to make revisions to some deliverables as you go through the semester based on comments provided by the instructors.

Grading Policy:

The quizzes count 40% of your final grade. All of the quizzes are evenly weighted, regardless of the number of questions. The project submissions count another 40% of your final grade. Each of the project submissions will be graded with a maximum score of 10. You can find the grading rubric in the team project document in the Syllabus and Course Information section of Canvas. The peer evaluations will be graded based on the rubric found in the team project document. Your evaluation by your teammates counts 20% of your final grade.

A final grade of A indicates achievement of consistent excellence and distinction throughout the course—that is, conspicuous excellence in all aspects of assignments in every week.

A final grade of B indicates work that meets all course requirements on a level appropriate for graduate academic work. These criteria apply to both undergraduates and graduate students taking the course.

Please note that +/- grades will be displayed on your course transcript, but + and – grades are not calculated as part of your GPA.

Grade categories are as follows:

Score Range	Letter Grade
100-98	= A+
97-94	= A
93-90	= A−

Score Range	Letter Grade
89-87	= B+
86-83	= B
82-80	= B−
79-77	= C+
76-73	= C
72-70	= C−
69-67	= D+
66-63	= D

Final grades will be determined by the following weighting:

Item	% of Grade
Quizzes	40%
Team project deliverables	40%
Peer evaluations	20%

Policies

Additional Resources:

Personal Wellbeing

If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider connecting with the Johns Hopkins Student Assistance Program (JHSAP). If you are concerned about a friend, please encourage that person to seek out our services. JHSAP can be reached at 443-287-7000 or https://jhsap.org/

Tutoring Website

Johns Hopkins Engineering for Professionals offers a tutoring connection network that allows students to connect with other Johns Hopkins Engineering students or alumni for tutoring services. This service allows students to search a list of courses to “Find a Tutor” or complete a profile to “Become a Tutor.” More information about this service can be found on the tutoring website (https://tutor.ep.jhu.edu/).

Deadlines for Adding, Dropping and Withdrawing from Courses

Students may add a course up to one week after the start of the term for that particular course. Students may drop courses according to the drop deadlines outlined in the EP academic calendar (https://ep.jhu.edu/student-services/academic-calendar/). Between the 6th week of the class and prior to the final withdrawal deadline, a student may withdraw from a course with a W on their academic record. A record of the course will remain on the academic record with a W appearing in the grade column to indicate that the student registered and withdrew from the course.

Academic Misconduct Policy

All students are required to read, know, and comply with the Johns Hopkins University Krieger School of Arts and Sciences (KSAS) / Whiting School of Engineering (WSE) Procedures for Handling Allegations of Misconduct by Full-Time and Part-Time Graduate Students.

This policy prohibits academic misconduct, including but not limited to the following: cheating or facilitating cheating; plagiarism; reuse of assignments; unauthorized collaboration; alteration of graded assignments; and unfair competition. Course materials (old assignments, texts, or examinations, etc.) should not be shared unless authorized by the course instructor. Any questions related to this policy should be directed to EP's academic integrity officer at ep-academic-integrity@jhu.edu.

Students with Disabilities - Accommodations and Accessibility

Johns Hopkins University values diversity and inclusion. We are committed to providing welcoming, equitable, and accessible educational experiences for all students. Students with disabilities (including those with psychological conditions, medical conditions and temporary disabilities) can request accommodations for this course by providing an Accommodation Letter issued by Student Disability Services (SDS). Please request accommodations for this course as early as possible to provide time for effective communication and arrangements.

For further information or to start the process of requesting accommodations, please contact Student Disability Services at Engineering for Professionals, ep-disability-svcs@jhu.edu.

Student Conduct Code

The fundamental purpose of the JHU regulation of student conduct is to promote and to protect the health, safety, welfare, property, and rights of all members of the University community as well as to promote the orderly operation of the University and to safeguard its property and facilities. As members of the University community, students accept certain responsibilities which support the educational mission and create an environment in which all students are afforded the same opportunity to succeed academically.

For a full description of the code please visit the following website: https://studentaffairs.jhu.edu/policies-guidelines/student-code/

Classroom Climate

JHU is committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone has the right to be treated with dignity and respect. Fostering an inclusive climate is important. Research and experience show that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. At no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.

If you have concerns in this course about harassment, discrimination, or any unequal treatment, or if you seek accommodations or resources, please reach out to the course instructor directly. Reporting will never impact your course grade. You may also share concerns with your program chair, the Assistant Dean for Diversity and Inclusion, or the Office of Institutional Equity. In handling reports, people will protect your privacy as much as possible, but faculty and staff are required to officially report information for some cases (e.g. sexual harassment).

Course Auditing

When a student enrolls in an EP course with “audit” status, the student must reach an understanding with the instructor as to what is required to earn the “audit.” If the student does not meet those expectations, the instructor must notify the EP Registration Team [EP-Registration@exchange.johnshopkins.edu] in order for the student to be retroactively dropped or withdrawn from the course (depending on when the "audit" was requested and in accordance with EP registration deadlines). All lecture content will remain accessible to auditing students, but access to all other course material is left to the discretion of the instructor.