Course Syllabus

Course Title
Systems Analysis and Design

Semester
Spring 2021

Course Number
IS446 – AOG/AOU

Instructor
Kevin Trainor

Class Times
Online meetings will be held on Tuesday from 6:00 PM till 8:00 PM using Zoom. I look forward to joining you there. Please use a headset.

Online Lab Sessions
On Sunday afternoons from 12:00 PM till 1:00 PM, I will be holding an optional Online Lab Session using Zoom. Please drop by to ask a question, to discuss solutions to previous assignments, to get help with the current assignment, to discuss the final project, or just to say hello. I will work with students on a first come, first served basis. Please use a headset.

If you need to arrange a private meeting with me, or if you need to arrange a lab session on a different day/time, please send me an *Individual Meeting Request* via the Service Desk (see *Contacting Instructor or TA* below).

Contacting Instructor
The preferred method for contacting me is by entering a request using the Service Desk for this course. PLEASE, DO NOT send requests to my regular email address.

The Service Desk for this course has been implemented using the JIRA Service Management product. If you are new to using the service desk in one of my courses, please visit the Service Desk Introduction for instructions and tips.

On an emergency basis, you may contact me using my mobile phone number: 847-650-9706.

Course Description

This is an introductory course in systems analysis for computer-based information systems. Systems analysts are primarily responsible for eliciting user requirements, proposing a systems solution that meets those requirements, creating a model of the requirements and a proposed solution that can be understood by both system users and system developers. Systems analysts also get involved in project identification, planning, management, supervision of detailed system design and supervision of system construction.

This course will cover two competing approaches to systems analysis and development: the traditional approach (sometimes called the *waterfall* approach), and the *agile* system development approach.

Course Topics

- The Role of the Systems Analyst
- From Where Does Our Software Come
- Competing Approaches to System Development: Waterfall, Agile, Hybrid
- Initiating and Planning Systems Development Projects
- Determining System Requirements
    - Business Process Modeling
- Structuring System Process Requirements
    - Context Diagrams
    - Use Cases
    - Activity Diagrams
- Structuring System Data Requirements
    - Conceptual Data Modeling
- Designing Interfaces and Dialogues
- System Implementation
- Maintaining Information Systems

Learning Outcomes

After completing this course, you should be able to:

- Explain the role of the systems analyst in understanding the needs and managing the expectations of the project stakeholders.
- Explain the primary differences between the waterfall and agile approaches to system development.
- Explain how to identify and initiate a viable project using either the waterfall or the agile approach.
- Explain how to plan, elicit and gather system requirements effectively.
- Use systems analysis tools and techniques to model system requirements for both the waterfall and agile approaches.
- Explain the different ways in which the design of the system emerges in both the waterfall and agile approaches.
- Explain how programming, testing, installation, and maintenance activities fit into both the waterfall and the agile approach.

Required Texts

Valacich, J., & George, J. (2016). *Modern Systems Analysis and Design (8th Edition).* Pearson. ISBN 978-0134204925. You may substitute the 7th Edition. The 9th Edition is also a substitute. However, the 9th Edition is much more expensive and not necessary.

Layton, M., Ostermiller, S., & Kynaston, D. (2020). *Agile Project Management for Dummies (3rd Edition)*. For Dummies (Wiley). ISBN 978-1119676997.

Martin, R. (2020). *Clean Agile*. Pearson. ISBN 978-0135781869.

Technology Requirements

You will be completing Skills Practice assignments and working on the Final Project using your own computer. I recommend that you use a computer that runs Windows 10 or a recent release of MacOS. While the software that we will be using for this course does run on Linux computers, there will be substantially less technical support available for Linux. If you want to use a Linux computer for your coursework, please contact me first.

We will be creating a number of diagrams during the course. To do this, we will be using a free educational license for the LucidChart product. This diagrammer is available via the Web and runs equally well on Windows 10, macOS, and Linux computers. Instructions for obtaining your free educational license and on using the diagrammer will be included in the Weekly Schedule prior to the first assignment in which you need to use LucidChart.

The Final Project is a team project. Teams will be given the option of conducting the Final Project using either the waterfall or the agile approach. If your team uses the waterfall approach, you will be creating documents using a word processor and LucidChart. If your team chooses the agile approach, then at least some of the team members will need to produce working code. In that case, they will need developer tools. These developer tools might include Anaconda, Python, PyCharm, and Django. These are tools that students use in my IS430 and IS439 courses. So, I can easily make them available to your team. If your team chooses a different technology set, then I will do my best to coach you through the process of acquiring tools.

In any case, you need to choose a computer on which you can do all of these activities. As mentioned above, my best recommendation is to choose a computer that runs Windows 10 or a recent release of MacOS.

Course Schedule
The schedule for this course will be available via our Weekly Schedule at:

https://courseinfo.ligent.net/2021sp/_illinois/is446_aog_aou/index.html

The course schedule is always subject to reasonable change to account for changes in circumstances and to correct errors. When I make changes to the schedule, I will announce them via our Moodle Announcements Forum. Postings to this forum should result in you being sent an email copy of the announcement as well.

Course Elements

1. *Readings*

   Required readings will be assigned from the textbooks listed above and from other resources that will be identified in the Weekly Schedule. Generally, readings are chosen to accompany any lecture or tutorial video provided for the week. So, you should expect to complete the readings before playing recorded videos and/or before attending class.

2. *Live Lectures and Lecture Videos*

   The lectures for this course will be a combination of live lectures that I will deliver during our online sessions and pre-recorded lecture videos.

   I have pre-recorded lecture videos for all of the chapters that we will be covering from the Valacich & George text. While most of the material covered in the recorded lectures is from the textbook, I occasionally cover supplemental material in the lectures as well. I recorded these lectures a few years ago when I was using the 7th edition of the Valacich & George text. At that time, the course did not include as much material on agile system development. So please keep these issues in mind when playing the recordings.

   When we are covering the material from the Valacich & George text, the readings and the recorded lectures will cover the same material. I have marked both the readings and the lectures as *required*. While many graduate-level courses do not include lectures on the material from the text, some graduate-level learners prefer learning by listening. I invite you to try both the readings and the lectures. Then, **choose the usage pattern that works best for you**.

   Before playing my lecture videos, make sure that you have previously played *Tips on Playing My YouTube Videos* to assure that you get the most from your viewing experience.

3. *Tutorial Videos*

I have created tutorial videos for the following use cases:

- There are a number of tutorials that explain how to do activities necessary for the course. These include installing software, reading grading rubrics, submitting assignments, and related activities.
- Some tutorials are coordinated with the activities in your skills practice assignments. They represent a demonstration of the skill you will be expected to use when doing the assignment.

Because tutorial videos do not duplicate material covered by other resources, I recommend that you always play these recordings. Before playing my tutorial videos, make sure that you have previously played *Tips on Playing My YouTube Videos* to assure that you get the most from your viewing experience.

4. *Skills Practice Assignments*

In many weeks, there will be Skills Practice Assignments. These will be individual assignments in which you practice creating diagrams and other products that systems analysts are expected to create. These include products like a project charter, a product vision statement, a use case diagram, an activity diagram, a use case narrative, a user story, or an entity-relationship diagram.

In my experience, most of the tools and techniques that you will be learning in this class are easier to watch others use than they are to use yourself. During lectures, I may lecture on a particular document or diagram. Then, I will show you a finished version. Often, I will even demonstrate the step-by-step creation process for the diagram in a video tutorial. Then I will assign a Skills Practice Assignment that will be due by the week-end deadline. If you are like most of us, you will find the assignment harder to do than you expected. Often, you will struggle over how detailed or how summarized to make your document. Or techniques that looked easy will suddenly seem much harder. You can feel free to consult with me or others for appropriate advice. Finally, you will complete the assignment as best you can and submit it.

A Moodle submission activity will be provided for submitting each assignment. Instructions for each Skills Practice Assignment and a grading rubric will be published in the Weekly Schedule.

Solutions to Skills Practice Assignments will be posted to our Moodle site just before our next class session. You can expect us to review your solutions and mine at the beginning of our next class.

A major goal for this course is to build your proficiency in self-evaluation of your work. To build this skill, I will expect you to be able to estimate your grade on each skills practice assignment. The solutions to these assignments that are posted to our Moodle site and our review of those solutions during the next class will serve as your primary feedback for the assignment.

As secondary feedback, your skills practice assignment submissions will be graded and commented upon. This feedback will be published to the Moodle assignment submission activity within 2 weeks.

The grading rubric for Coding Assignments has been designed to promote two important behaviors:

- Submitting your work in a properly named and formatted file. This helps substantially with grading workflow.

- Submitting your work by the week-ending deadline. This assures that you will get the benefit of having tried to solve the problem on your own before seeing the solutions of others.

While separate grading rubric and assignment submission instructions documents will be published, the following is a summary of the coding assignment grading rubric features:

- 10 points will be awarded for submitting a single, properly named and properly formatted file to the proper Moodle assignment submission activity.

- A minimum of 75 points will be awarded for submissions that are submitted on time, and that demonstrate a good faith effort on all parts of the assignment. Late submissions will be awarded 74 points or fewer in this category.

The implication of this grading scheme is that you can expect a score of 85 or higher on all skills practice assignment submissions that meet both of these criteria.

5. *Participation*

Your participation grade will be earned based upon participation points that you will accumulate throughout the semester. The table below lists activities for which you may earn participation points and the points earned for each instance.

Activity	**Points Earned**
A *greetings* post made to the Service Desk for this course by the end of Week 2	10
1 post or reply made in the *Open Discussion* forum.	1
1 speaking contribution during class	2
1 chat contribution during class	1
1 presentation of your Skills Practice Assignment solution during class	5
1 presentation as spokesperson for your a breakout group or team during class	5

Your participation grade for the course will be calculated at the end of the semester based upon the number of participation points earned. Grading will be done on a curve. A student with the highest number of participation points can expect to earn a grade of 100. A student with the median number of participation points can expect to earn a grade of 85. Students with fewer than 10 participation points can expect to earn a grade of 0.

6. *Final Project*

During the first half of the semester, you will be learning fundamental systems analysis skills and getting ready for the Final Project. Before you are ready to start the Final Project, you need to accomplish the following:

- Form a team of 2 to 4 people that includes you and other members of our class.
- Find a real-world client with small to modest-sized problem or opportunity that can be solved using an information system solution.
- Choose a project approach for your systems analysis work: waterfall, agile, or some hybrid of the two.

If your team chooses the waterfall approach, then I will expect you to create documents that represent the requirements and the design of the system. I will not expect you to do coding, testing, and implementation.

If you team chooses the agile approach, then I will expect you to create the lighter-weight agile documents like the vision statement, product roadmap, and user stories. In addition, I will expect you to deliver the code that is produced in each of your sprints.

Choosing a team, a client, a problem, and an approach are interrelated in many ways:

- Some students already have relationships with potential clients, and some don't.
- Projects that use the waterfall approach can be bigger, because no code will be delivered.
- Conversely, projects that use the agile approach must be smaller, because code must be delivered.
- Some students who are potential team members have programming skills, and some don't.
- Some students may already have experience in working with clients to document requirements. Others may not.
- Some clients will find the analysis and design documents that result from a waterfall approach valuable. They might have a team who could implement the system from those documents.
- Other clients will only find value in the code that is produced by the agile approach. They may not have a technical team available to do implementation.

I plan to organize class activities (like breakout groups) to help you find potential team members and get started on your projects.

More details regarding the Final Project will be available in the form of an instructions document and a grading rubric. These will be made available in the Weekly Schedule by Week 4.

Basis for Determining Grade

Skills Practice Assignments are individual assignments. Grades will be assigned according to the scheme described above and documented in the grading rubric for each assignment.

The Final Project is a group assignment. Grades will be assigned for the group. Provided that all members of the group make a fair contribution to the work of the team, all team members will earn the same grade. That grade will be based on the grading rubric associated with the assignment.

I will be asking each team member to complete Peer Evaluations to assess their own contribution and the contribution of other team members. I will use these Peer Evaluations to assess whether each team member has made a fair contribution to the Final Project. In the case where a student has not made a fair contribution to the project, I reserve the right to give that student a lesser grade than that earned by the team as a whole. I have been using this approach to grading group projects for many years. Typically, everyone makes a fair contribution, and everyone gets the same grade. I include this grade adjustment provision here so that you know what to expect in the unlikely event that a student does not make a fair contribution.

The overall grade for the course will be calculated using the following percentage weights:

• Participation (individual grade)	10%
• Skills Practice assignments (individual grade)	45%
• Final project (team grade)	45%
o Project Plan (5%)	
o Project Report (15%)	
o Team Presentation Video (25%)	

Letter grades will be determined as follows:

• A+	97 - 100%;
• A	93 - 96%;
• A-	90 - 92%;
• B+	87 - 89%;
• B	83 - 86%;
• B-	80 - 82%;
• C+	77 - 79%;
• C	73 - 76%;
• C-	70 - 72%;
• D+	67 - 69%;
• D	63 - 66%;
• D-	60 - 62%;
• F	0 - 59%;

ISCHOOL AND UNIVERSITY ACADEMIC POLICIES

Academic Integrity

The iSchool has the responsibility for maintaining academic integrity so as to protect the quality of education and research in our school and to protect those who depend on our integrity. Consequences of academic integrity infractions may be serious, ranging from a written warning to a failing grade for the course or dismissal from the University.
See the student code for academic integrity requirements:
http://studentcode.illinois.edu/article1/part4/1-401/

Statement of Inclusion

http://www.inclusiveillinois.illinois.edu/mission.html
As the state's premier public university, the University of Illinois at Urbana-Champaign's core mission is to serve the interests of the diverse people of the state of Illinois and beyond. The institution thus values inclusion and a pluralistic learning and research environment, one which we respect the varied perspectives and lived experiences of a diverse community and global workforce. We support diversity of worldviews, histories, and cultural knowledge across a range of social groups including race, ethnicity, gender identity, sexual orientation, abilities, economic class, religion, and their intersections.

Religious Observances

In keeping with our Statement of Inclusion and Illinois law, the University is required to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements.

If you anticipate the need for an accommodation, please communicate with your instructor in the first two weeks of class. If you are an undergraduate student and your instructor requires an absence letter, you must fill out the Religious Observance Accommodation Request form:
https://cm.maxient.com/reportingform.php?UnivofIllinois&layout_id=19 . Other accommodations may be available.

Accessibility Statement

To obtain accessibility-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to disability@uiuc.edu .

COVID-19 Statement

In keeping with University and iSchool policy, all students are required to engage in appropriate behavior to protect the health and safety of our community. If you are on campus, this includes wearing a facial covering properly, maintaining social distance (at least 6 feet from others at all times), disinfecting the immediate seating area, and using hand sanitizer.

If you feel ill or are unable to come to class or complete class assignments due to issues related to COVID-19, including but not limited to: testing positive yourself, feeling ill, caring for a family member with COVID-19, or having unexpected child-care obligations, you should contact your instructor immediately and cc your advisor.

Contact Hours
This course will require approximately 54 contact hours.

Last Revised
2021-04-23