

# Course Syllabus

**Course Title**

Systems Analysis and Design

**Semester**

Fall 2023

**Course Number**

IS446 A-Section

**Instructor**

Kevin Trainor

**Teaching Assistant**

Muhammad Hassan

**Regular Class Sessions**

Regular class sessions will be held on Tuesdays from 9:30 AM till 11:30 AM in LISB 53. I look forward to joining you there.

**Optional Online Lab Sessions**

I hold optional lab sessions two times per week. Please join me 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.

The first optional lab session of the week takes place immediately following our regular class session. Since class sessions typically end earlier than their scheduled two-hours, I devote the remainder of the time available to helping students. Often, I can stay beyond the two-hour period if many students need help.

On Friday afternoons from 2:00 PM till 3:00 PM, I will be holding an optional online lab session using Zoom. This represents a good opportunity to get help with your weekly assignments before the submission deadline on Sunday night. Please use a headset when joining the online lab session.

**Office Hours**

I do not hold conventional open office hours. Students needing help with assignments are encouraged to join in the online lab sessions (see above). Students who need to discuss confidential matters can arrange for an individual meeting with me on Zoom. If you need to arrange an individual meeting with me, please send me an *Individual Meeting Request* via the HelpDesk for this course (see *Contacting Instructor or TA* below).

## Office Hours

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## Contacting Instructor or TA

The preferred method for contacting me, or our TA is by entering a request using the [Trainor HelpDesk](#). The HelpDesk system allows you to open a ticket and correspond back-and-forth with the HelpDesk team (me and our TA) using regular email. **Please, do not send requests to our regular email addresses.**

For an introduction to the HelpDesk system, please see [About Trainor HelpDesk](#).

For assistance in creating and sending email to the HelpDesk system related to this course (IS446 A-Section), please see [IS446 A-Section - Compose Email](#).

## 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 Essence of Systems Analysis and Design in the Age of Options
- Identifying Opportunities for Business Transformation with IT
- Identifying and Documenting Key Concepts in the Domain of Interest
- Articulating Future System Capabilities with User Stories and UI Models
- Selecting the Optimal Project Approach
- Project Planning and Creating the Product Backlog
- Identifying Development Options: Selecting Implementation Approach and Determining Sources of Resources
- Creating Use Case Narratives: When, How, and Why?
- Architectural Context for Systems Development
- Estimating Software Project Effectively
- Estimating Business Benefits and Analyzing the Systems Investment
- Planning to Succeed Using Project Documents
- Designing the User Experience and User Interfaces
- The Role of the Business Analyst in Technical Design
- Leading Iterative Software Construction
- Making the Changes Real: Systems Change Management and Deployment

## 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

Spurrier, G. & Topi, H. (2021). *Systems Analysis and Design in an Age of Opportunities*. Prospect Press. Paperback ISBN: 978-1-943153-70-1. eTextbook ISBN: 978-1-943153-81-7.

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

Oppel, Andrew J. (2010) *Data Modeling: A Beginner's Guide* New York: McGraw-Hill, ISBN-10: 0071623981, ISBN-13: 978-0071623988

## 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 (either Windows 10 or 11) 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 an educational license for the LucidChart product. This diagrammer is implemented in a Web browser and runs equally well on Windows, macOS, and Linux computers. Instructions for obtaining your 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 (either Windows 10 or 11) or a recent release of MacOS.

The tools described above are those that I recommend for your use when completing work for this course. If you are not able to use one of these tools because of accessibility reasons, please contact me to get approval for a suitable alternative that meets your needs as a student and our needs as graders.

### **Course Schedule**

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

[https://courseinfo.ligent.net/2023fa/illinois/is446\\_a\\_section/index.html](https://courseinfo.ligent.net/2023fa/illinois/is446_a_section/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 Canvas 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. Lecture Videos*

I typically will not be using our online class time for lectures. Instead, I will be providing links to pre-recorded video lectures for each unit that we cover. While most of the material covered in the recorded lectures is from one of our textbooks, I often cover supplemental material in the lectures as well. I always include commentary that I believe adds value to the text.

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.

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*

There will be weekly Skills Practice Assignments. As mentioned above, skills practice assignments will often be paired with tutorial videos. These should allow you to complete your Skills Practice Assignment using the same general approach that has been demonstrated in the tutorial video.

A Canvas 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 Canvas site immediately before our next online 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 skills practice assignments posted to our Canvas 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 Canvas assignment submission activity within 2 weeks.

For information regarding the grading of skills practice assignments, please see *Skills Practice Assignment Submissions That Meet Certain Criteria Are Subject to a Minimum Score Guarantee* under *Grading Policies* below.

## 5. *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 your 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 has been produced in each of your sprints.

Choosing a team, a client, a problem or opportunity, and an approach for your Final Project are interrelated in many ways:

- Some students already have relationships with potential clients, and some don't.
- A project on which a team will use a waterfall approach can address a larger scope, because no implementing code will be delivered.
- Conversely, a project on which a team will use the agile approach must address a smaller scope, because implementing 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 technical 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 will organize in-class activities (like breakout groups) to help you find potential team members, identify clients, formulate projects and get started.

More detailed instructions and a grading rubric for this assignment will be published separately.

6. *Attendance*

The iSchool expects students to attend all classes except in cases of emergency. See *Student Code on Attendance*: <http://studentcode.illinois.edu/article1/part5/1-501/>. Students in online classes who miss a class session are expected to play the recording of that class session. If you need help locating the recording of a class session, please contact the iSchool Help Desk.

7. *Participation*

Your participation in the course is an important element of the course. Accordingly, a significant portion of your grade for this course will be determined by your participation. Students will earn participation credit for:

- Making speaking contributions during class.
- Making chat contributions during class.
- Presenting your work during class.
- Presenting as a spokesperson for breakout groups during class.

For information regarding the grading of participation, please see *Your Participation Grade Will Be Based Upon Participation Points Earned Throughout the Semester* under *Grading Policies* below.

## **Course Grading Policies**

1. *iSchool and University Grading Policies Apply*

Many iSchool and University Academic Policies have grade implications. Please see *iSchool and University Academic Policies* below.

2. *Careful Attention to Detail is Required*

One important goal of this course is to train you to become a responsible information professional. The work of information professionals is highly detail oriented. Clients rely on information professionals to deliver a correct work product that conforms to stated requirements and best practices.

When your work is graded, deductions will be made for all deviations from the assignment instructions. Some of these deductions will be made for small deviations that may seem insignificant to you. So, it is a good practice to carefully check your work against all instructions before submitting.

3. *Assignment Resubmissions are Not Permitted After the Assignment Deadline*

While assignments may be resubmitted before the assignment deadline, they may not be resubmitted after the assignment deadline. If you should accidentally make a submission that is somehow defective, you must discover and correct this error before the assignment deadline. Resubmission of assignments after the deadline will not be permitted for any reason.

4. *Deadline Extensions Must be Requested Before the Deadline*  
If you believe that you have a valid reason for a deadline extension, please submit a *Deadline Extension Request* using the HelpDesk before the deadline. I have a practice of granting reasonable extension requests. I will only grant extensions beyond the beginning of our next class session in very limited circumstances.
5. *Deductions Will be Made for Late Submissions*  
The grading rubrics for skills practice assignments and for the Final Project include substantial deductions for late submissions. Please see the assignment grading rubrics for more details.
6. *Assignments Submitted Too Late Will Not be Graded*  
Skills practice assignments submitted more than 14 days late will be considered *too late*. Final Projects submitted more than 7 days late will be considered *too late*. Assignments that are submitted *too late* will not be graded. These submissions will earn a grade of zero. If you are in danger of missing the *too late* deadline, and you believe that you have a valid reason for an extension, please submit a *Deadline Extension Request* using the HelpDesk before the deadline.
7. *Grade Adjustments Will Be Limited to Automatic Rounding*  
All grades will be awarded on 0 to 100-point scale. Fractional values will be rounded automatically. Fractional portions of grades ending in .0 through .4 will be rounded down. Fractional portions of grades ending in .5 through .9 will be rounded up.  
  
No further adjustments will be made to grades. This policy applies even in situations where increasing a grade by just 1 point would cause a student's final letter grade for the course to cross a threshold (i.e. from B+ to A-). Regardless of the potential consequences, grade adjustments will be limited to automatic rounding.
8. *Re-Grading Requests Made Using the HelpDesk Will be Given Fair Consideration*  
It is possible for one of your assignment submissions to be missed during the grading process. This is especially true for assignments that are submitted late. If this happens to you, please submit a Re-Grading Request to the HelpDesk to remind us that your submission still needs grading. Make sure to fully identify the assignment that needs attention.  
  
Each assignment that we grade is accompanied by a grading feedback form. Please read this feedback to understand our grading decisions. If, after reading the grading feedback form, you believe that our grading decisions are somehow unfair, please submit a Re-Grading Request to the HelpDesk. Include details in your request that identify the assignment and your rationale for the re-grading request. We will give these requests fair consideration and inform you of our determination by posting back to the HelpDesk ticket.
9. *Extra Credit Opportunities are Not Available*  
I have designed the grading policies for skills practice assignments such that poor performance on one skills practice assignment should not spoil your entire semester grade (see item 11, below). Consequently, I do not offer any opportunities to submit work for extra credit.



10. *The Expected Grade for Assignment Submissions That Meet All Expectations is 95*  
The grading rubrics for all assignments have been designed such that submissions that meet all expectations for the *Regular Exercises* will score 95 points.

Assignments will also include a *Challenge Exercise*. Students who choose to submit the Challenge Exercise may earn from 0 to 5 additional points. Challenge Exercises are designed to be quite difficult and the amount of help available from the instructor for Challenge Exercises will be limited to hints.

11. *Skills Practice Assignment Submissions that Meet Certain Criteria are Subject to a Minimum Score Guarantee*

The grading rubric for Skills Practice 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 assignment 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 skills practice assignment grading rubric features:

- 10 points will be awarded for submitting a single, properly named and properly formatted file to the proper Canvas 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 Regular Exercises. 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 criteria.

12. *Your Participation Grade Will Be Based Upon Participation Points Earned 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
Speaking contributions during class	2
Chat contributions during class	1
Presentations of your work during class	5
Presentations as a spokesperson for your a breakout group during class	5

Your participation grade for the course will be calculated at the end of the semester based upon the total number of participation points earned. Participation grades will be calculated using a curve. The grading curve calculation is summarized in the following table. Please note that students earning fewer than 10 participation points will earn a participation grade of zero.

Participation Points Percentile	Participation Points	Participation Grade
100	NA	100
75	NA	95
50	NA	90
25	NA	80
10	NA	70
< 10	>= 10	60
NA	< 10	0

13. *Attendance at Class Sessions May Affect Your Grade*

While attendance is not graded directly, it may have a significant impact on your participation grade. Nearly all activities that earn participation credit occur during class.

### **Basis for Determining Overall Course 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%
  - Project Plan (5%)
  - Project Report (15%)
  - 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%;

Please note that when converting overall course number grades to letter grades, simple rounding of number grades will be used. Please see *Grade Adjustments Will Be Limited to Automatic Rounding* under *Grading Policies* above.

## **ISCHOOL AND UNIVERSITY ACADEMIC POLICIES**

### **Incomplete Grades**

An exceptional request for an incomplete grade is most often granted to students encountering a medical emergency or other extraordinary circumstances beyond their control. Students must request an incomplete grade from the instructor. The instructor and student will agree on a due date for completion of coursework. The student must submit an Incomplete Form signed by the student, the instructor, and the student's academic advisor to the front office:

<https://uofi.app.box.com/s/sx7arobhr0gfw12teaetmp1qq32ifdrd>

Please see the Student Code for full details:

<http://studentcode.illinois.edu/article3/part1/3-104/>

### **iSchool Academic Integrity Statement**

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**

<https://diversity.illinois.edu/about/senate-diversity-resolution/>

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](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](mailto:disability@uiuc.edu) .

**iSchool 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 being fully vaccinated, wearing a facial covering properly when required, maintaining social distance, if requested, and using hand sanitizer as needed.

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 the instructor immediately and cc your advisor.

**Contact Hours**

This course will require approximately 54 contact hours.

**Last Revised**

2023-08-12