

Spring 2020

## IS 390-452: Requirements Analysis and Systems Design

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### Recommended Citation

Ullman, David F., "IS 390-452: Requirements Analysis and Systems Design" (2020). *Informatics Syllabi*. 129.

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New Jersey Institute of Technology  
Ying Wu College of Computing  
Department of Informatics

**IS 390-452: Requirements Analysis and Systems Design**

Online Delivery

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Professor of Practice

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Online Office Hours: Tuesdays Online Via Web-Ex – 4:00 – 5:30 PM

In-Person Office Hours: Friday 11:30 AM – 12:45 pm

Additional Online and In-person Office Hours by Appointment

Course Summary

This course is designed to be a study of the information systems development life-cycle (SDLC), from the initial stages of information requirements analysis and determination to the ultimate activities involving systems design. The course offers theory, methodologies and strategies for information requirements analysis, including the assessment of transactions and decisions, fact-finding methodologies, structured analysis development tools, strategies of prototype development, and an overview of computer-aided software engineering (CASE) tools. The course includes theory, methodologies and strategies for systems design.

As the industry need for a robust IT infrastructure arise, companies realize the need for people who understand both the basics of information technology and the essence of the business domain, people who could communicate with both computer programmers and business managers, people who serve as the “bridge” between the IS department and other business function units. These people are called system analysts / business analysts.

The purpose of this class is to prepare you to become such people by giving you a thorough understanding of different types of information systems as well as business processes that they support. In this class, systems analysis and design methods that facilitate an object oriented approach to the modeling of the data and applications supporting these processes will be introduced and practiced. This course lays out a solid foundation for more advanced technical courses such as database management or networking by offering you a systematic methodology that should be followed when managing the development of any information systems.

Required Background

Prerequisites: One of the following: (CS 103, CS 113, CS 115, IS 218 or IT 202) or permission of instructor.

Course Objectives

When you complete this course you will have the ability to:

- Be familiar with different types of System Development Life Cycle (SDLC) models; Know how to choose appropriate SDLC models based on the nature of system development projects

- Effectively use tools of systems analysis to specify (evolve) the requirements of an information system
- Master the designing skill for interface, database and program design frequently used in business information systems
- Participate as an analyst/team member on a systems development team working with a real world organization
- Effectively utilize appropriate data gathering tools and techniques associated with the collection of system user requirements, constraints and expectations
- Describe, structure and plan an information systems development project's activities using basic Project Management techniques and tools
- Perform basic feasibility study activities associated with systems proposals
- Understand the basics of object-oriented system analysis and design methods

### Required Text:

Dennis, Alan; Barbara Haley Wixom and Roberta M. Roth, *Systems Analysis and Design*, 7th Edition, Wiley (2018). ISBN-13: 978-1119496502; ISBN-10: 1119496500; Digital Versions are acceptable.

Note this is the 7th Edition, published in December 2018. The sixth edition is acceptable. However, the 7<sup>th</sup> edition will have the most recent relevant examples and case studies. Do consider this as an investment you may keep during your initial professional working days. We will utilize the textbook extensively so it is important that you have access to it. Several additional readings will be posted in Moodle.

### Academic Integrity

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found [here](#).

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. *Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.*

There will be no warnings or second chances with regard to cheating. It is your responsibility to understand specifically, what constitutes academic dishonesty. Ignorance is not an excuse or a defense. It is also your responsibility to understand the rules for properly citing the work of others in submission of classwork. Improper citation with a simple "copy/paste" from online sources may be grounds for failure of the assignment and/or the course.

If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu).

### Learning Management System:

We shall be using the Moodle learning management system (LMS) for on-line discussions, assignment submissions, distribution of readings, announcements and other activities. Lecture recordings will be made available in Moodle prior to the week in which they are scheduled. It is your responsibility to check Moodle regularly.

### Course Structure and Components:

Systems Analysis and Design (SAD) is an exciting, active field in which analysts continually learn new techniques and approaches to develop systems more effectively and efficiently. However, there is a core set of skills that all analysts need to know no matter what approach or methodology is used. All information systems projects move through the four phases of planning, analysis, design, and implementation; all projects require analysts to gather requirements, model the business needs, and create blueprints for how the system should be built; and all projects require an understanding of organizational behavior concepts like change management and team building.

This course captures the dynamic aspects of the field by keeping students focused on doing SAD while presenting the core set of skills needed by a systems analyst. A major aspect of the course will be a semester long project where student groups will go through each of the major steps within systems analysis and design for an information system.

The course is divided into seven modules, with each focusing on one or more parts of SAD, covering one or more chapters of the textbook. Each module will have with it a quiz, based on lectures and textbook chapters, and a discussion exercise. For five of the major modules there will be a homework exercise to prepare students for that aspect of the semester long project.

The goal is for students to complete the course with experience that will form a rich foundation for further work as a systems analyst.

#### 1. Summary:

- A. The course is divided into seven Modules:
  - Module 01 – Introduction to SAD and Planning in the SDLC
  - Module 02 – Analysis Part 1: Requirements Gathering and Use Cases
  - Module 03 – Analysis Part 2: Process Modelling
  - Module 04 – Analysis Part 3: Data Modeling
  - Module 05 – Design Part 1: Architecture and User Interface Design
  - Module 06 – Design Part 2: Program and Data Design
  - Module 07 – Implementation
- B. Each Module has one or more Units of lecture material that may be covered over several weeks.
- C. Each Unit of lecture may be further divided into several smaller parts for ease in consumption. (e.g. Unit #1A, Unit #1B, Unit #1C, etc.)
- D. Each Module generally has several individual and group activities:
  - Group Discussion
  - Group Homework Exercise
  - Quiz on Lecture Material
- E. There is a Midterm Exam at the end of Module 04, and a cumulative Final Exam at the course conclusion. Both are online requiring use of the Respondus Lockdown Browser. The exams cover lectures, textbook readings, any additional readings, discussions, and homework exercises.
- F. See the Outline and Schedule with Due Dates at the end of this syllabus and posted in Moodle

#### 2. Lectures

Lecture recordings and supplemental references will be posted in Moodle weekly. In general, the lectures follow the textbook, but should not be considered a replacement for the textbook.

#### 3. Quizzes - (10% of final grade)

There will be seven graded quizzes during the semester. Each quiz is meant to review and test your knowledge of the material covered over several weeks. You will be able to take each quiz as many times as you like before the cut-off date to raise your grade. There is a time limit for each quiz administration and a wait period between each attempt to discourage simply looking up answers. The questions for each quiz are typical of those that will be found on the midterm and final exams and are largely provided by the textbook author. The online quizzes account for 10% of the course final grade.

4. Group Discussion Forums - (10% of final grade)

There will be seven graded discussions during the course, corresponding to each of the modules. Each discussion forum will have a number of posted questions where students will be required to choose and answer one original question, and respond to at least two other questions with value-added comments. The rubric for assessment will be posted in Moodle. Cumulative participation in all group discussions will be 10% of the course final grade.

5. Group Homework Exercises - (20% of final grade)

There will be five group homework exercises. In general, these homework exercises are to help you master the systems analysis and design skills required for corresponding steps in the semester long major project. These group homework exercises account for 20% of the final grade.

6. Semester Long Group Project - (30%)

One of the biggest difficulties for many students in this class is their lack of real world system development experiences -- Imagine trying to learn how to drive through a series of lectures without ever touching a car! That is why the group project is extremely important for your learning in this class.

A semester long project will have groups design a major information system. Groups will provide deliverables along the major steps of the systems development lifecycle (SDLC). There will be five deliverables, each related to one of the homework exercises. The five deliverables account for 30% of the course grade. Further details will be provided in Moodle.

7. Exams - (30%)

There will be a midterm and final exam, both administered online. The midterm exam accounts for 10% of the final course grade, and the final exam accounts for 20%. Questions for these exams will largely be drawn from the quizzes and discussion questions. *You must be available at the stated times to take the online exam. You will be asked to acknowledge this at the start of the course.*

Group Work:

Group work is an important part of this course. Students will be allowed to self-select into groups (teams) of 4-5 individuals by a certain date. Students not having formed a group will be formed into separate groups (teams) by the instructor. It is expected that all students will contribute equally to the work of a group. Each group submission will include a cover page affirming such.

Recognizing that the semester long group project requires a sustained commitment of all members. If a group finds that a member is not carrying his/her assigned group responsibilities, the group will be able to petition the instructor to have that individual removed. Before this petition is accepted, the group and

instructor will meet to discuss. If an individual is removed from a group, he/she will have to complete project steps individually. Please take group responsibilities seriously.

Grading Scales:

There are two different grading scales used for the course as shown in following table. The descriptions for letter grades are NJIT academic policy for undergraduate courses:

SCALE #1: LETTER GRADE SCALE	SIGNIFICANCE	SCALE #2: PERCENTAGE SCALE	CALCULATION
A	Superior	A	90% and above
B+	Excellent	B+	85% - 89%
B	Very Good	B	80% - 84%
C+	Good	C+	75% - 79%
C	Acceptable	C	70% - 74%
D	Minimum	D	60% - 69%
F	Inadequate	F	Below 60%

1. Grading components used will be announced with particular assignments.
2. The Moodle Gradebook does not handle mixed scales well. Therefore, the final average computed in the Moodle Gradebook may not be correct. However, the individual components will be accurately recorded.
3. Unexcused late assignment submissions may not be accepted, or accepted with penalty

Miscellaneous:

1. Moodle has two Important Discussion Forums. You are auto-subscribed to both with your NJIT email address:
  - News and Instructor Announcements – This will be used for general news and announcements for the instructor. The instructor generally initiates original postings. Students may ask questions as REPLIES to Instructor postings.
  - Help and Open Discussion, and Interesting Links Forum – This is for you to ask a general question on the course, start a discussion on something course related (that is not discussed elsewhere), or share interesting course related material you come across. Student should feel free to answer questions posed by classmates.
2. Assignments are due according to the schedule published at the end of this syllabus. Unexcused late submissions may have a full letter grade deduction.

3. If you have a question that is particular to you as an individual (e.g. grade, late assignment) you may e-mail me directly. Please put IS-390 in the subject line so that I can filter your emails to be read quickly (as opposed to them being ignored as junk e-mail).
4. My office hours this semester are posted above. For other times, please message me and we can arrange a phone call or virtual meeting at a mutually convenient time (including evenings and weekends).
5. Feel free to stop by my office anytime that I am on campus. If I am unable to meet with you, we'll arrange a time convenient for you.
6. If you don't get a response from me on an email message (with IS 390 in the subject line) within 24 hours, please feel free to email again.
7. My primary job is a facilitator to help you learn about systems analysis and design. Please don't hesitate to contact me with questions.

**IS 390 – Outline/Weekly Schedule – Spring 2020 Semester**

Week	Module	Date (Begins Monday)	Topic	Quiz - Closes at 11:55 PM	Discussion Questions Due by 11:55 PM	Group Homework Assignment Due by 11:55 PM	Project Deliverables Due by 11:55 PM
1	01	Jan 20	Chap 1: The Systems Analyst and Information Systems Development	Quiz #1 Closes Mon, Feb 3	Discussion Closes Wed. Feb. 5		
2		Jan 27	Chap 2: Project Selection and Management				
3	02	Feb 3	Chap 3 Requirements Determination	Quiz #2 Closes Mon. Feb. 17	Discussion Closes Wed. Feb. 19	HW #1 Due: Fri. Feb. 14	Requirements - #1 Due: Wed. Mar. 2
4		Feb 10	Chap 4: Use Case Analysis			HW #2 Due: Tue. Feb. 25	Use Cases - #2 Due: Wed. Mar. 25
5	03	Feb 17	Chap 5: Process Modeling	Quiz #3 Closes Mon, Mar 2	Discussion Closes Wed. Mar. 4	HW # 3 Due: Fri. Mar. 6	Process Modeling - #3 Due: Wed Apr. 8
6		Feb 24					
7	04	Mar 2	Chap 6 Data Modeling	Quiz #4 Closes Mon, Mar 23	Discussion Closes Mon. Mar 23	HW #4 Due: Mon. Mar. 23.	Data Modeling - #4 Due: Wed. Apr. 22
8		Mar 9					
		Mar 16	Spring Break				
9		Mar 23	Midterm Exam – Friday, March 27 – 4:00 pm – 6:00 pm				
10	05	Mar 30	Chap 7 – Moving into Design Chap 8 – Architecture Design Chap 9 – User Interface Design	Quiz #5 Closes Mon. Apr. 13	Discussion Closes Wed. Apr 15		
11		Apr 6					
12	06	Apr 13	Chap 10 – Program Design	Quiz #6 Closes Mon. Apr. 27	Discussion Closes Wed. Apr 29	HW #5 Due: Friday, May 1	Program and Data Design #5 Due: Wed May 6
13		Apr 20	Chap 11 – Data Design				
14	07	Apr 27	Chap 12 – Moving into Implementation Chap 13 – Transitioning to the new System	Quiz #7 Closes Mon. May 4.	Discussion Closes Wed. May 6		
15		May 8- 14	<b>Final Exam</b> – To Be scheduled by Registrar's Office.				