

Syllabus for “ISE 323: Information Systems Engineering 1”

Kinneret College on the Sea of Galilee

School of Engineering

Instructor: Michael J. May

Semester 1 of 5770

1 Course Details

The course meets **2pm-5pm** on Wednesdays. The Targil for the course is **11am-1pm** on Mondays.

The course has **3** hours of lecture and **2** hours of Targil. The room for the course is **Room 203** in the Sciences Building. The room for the Targil is **Room 214** in the Sciences Building.

2 Overview

Information systems are a fusing of information technology with users and business processes, so they are by nature complex. Information systems engineering includes elements from software engineering, information collection and analysis, management, and risk analysis. The goal of this course is to introduce a scientific methodology for *the planning, analysis, and design* of new information systems or upgrades to existing information systems. To that end will spend time on several key aspects of information systems engineering: gathering information in a structured way, producing diagrams which effectively represent behaviors and interactions, constructing planning and design documents, and planning the execution of new or improved systems.

The course is loosely structured on a book by Shoval [5] which the course uses as its main text. The book centers on the ADISSA functional design approach, but broadly addresses the whole system planning-analysis-design-implementation life cycle as well. Material from other books is introduced throughout the semester to give more depth to specific topics.

2.1 Course Description

The stated goals of the course, as listed in the course description is to introduce the functional approach to Information Systems (IS) analysis. It includes topics related to IS life cycle and general approaches in IS development. The following phases of IS planning are discussed:

- Planning Phase
- Existing State Study
- Initial System Characterization
- Feasibility Analysis
- Selection of Potential Approaches

The following phases and artifacts of IS analysis are discussed:

- Functional-Hierarchical Analysis using Data Flow Diagrams (DFDs) and Functional Hierarchical Decomposition (FHD)
- Data Dictionaries

The following phases and artifacts of IS design are discussed:

- System Design using ADISSA:
 - Software
 - Processes
 - Interfaces
 - Inputs
 - Outputs
 - Database Schema

The course also introduces the use of SQL for data access. This material is cross linked to the concurrently offered course “Database Systems”. This course will apply some techniques from the other course, including Entity Relationship Diagrams (ERD) and database normalization.

The course will conclude with the introduction of object-oriented techniques (primarily from Shoval [6]) for analysis and development of information systems, topics which will be covered in more depth in the followup course Information Systems Engineering 2.

3 Lecture Schedule

The main book for the course, as listed below, is *Planning, Analysis, and Design of Information Systems* by Shoval [5]. The applicable chapter readings for each lecture as listed in the column PS98 below. Additional material for the class will be brought from *Analysis and Design of Information Systems* by Shoval [6] (PS04), *Improving Survey Questions* by Fowler [1] (F), and *Evaluating Information Systems* edited by Irani and Love [3] (IL). Additional reference information is indicated in the O column.

#	Date	Subject	PS98	PS04	F	IL	O
1	21 Oct	Intro to IS, ADISSA	1.1, 1.2			Intro	[7](17)
2	28 Oct	Planning, Existing State Examination	2.1–2.3		1,3		
3	4 Nov	Interviews and Questionnaires			2,4		
4	11 Nov	Questionnaires 2, Existing State & Initial Design	2.4, 3.1				
5	18 Nov	Analysis of Alternative Strategies and RFPs	3.2, 3.3			1	
6	25 Nov	Evaluation and Comparison of Proposals	4.1–4.3			1	
7	2 Dec	Analysis using Data Flow Diagrams	5.1, 5.2				[4]
8	9 Dec	FHD, Data Dictionaries, Transactions 1	6.1–6.2,7.1				
9	16 Dec	Transactions 2, Input Techniques	7.1,8.1–8.2				
10	23 Dec	Output Processes, User Interfaces	7.2, 8.3				[2]
11	30 Dec	DBs: Schemas, Normalization	9.1–9.3				[2]
12	6 Jan	Prototypes, Objects and OO Design	10.1	1.1–1.5			[4]
13	13 Jan	FOOM and OO-DFDs		2.1–2.4			
14	20 Jan	IS Evaluation & Justification, Wrap up				6	

Students are expected to come to class having read the material listed above in the lecture schedule. Students who do not come prepared will find themselves at a significant disadvantage.

4 Quizzes

There will be (a maximum of) four in class short quizzes at the beginning of lectures during the course of the semester. The quizzes will take place from 2:00-2:10pm. There will be (a maximum of) one quiz during weeks 1–3, one between weeks 4–6, one between weeks 7–9, and one between weeks 10–13. The quiz material will come from the readings assigned for the lecture on which the quiz is given. Students will be told of the upcoming quiz **in class the week before the quiz**.

Students may skip or drop the grade of one of the quizzes without penalty. Students who miss a quiz due to Milum duty will be allowed to (additionally) drop the missed quiz.

Students who arrive in class after 2:10pm will not be given the opportunity to take the quiz.

4.1 Tentative Quiz Schedule

Quizzes will tentatively take place on the following dates and on the following material:

#	Date	Topic	Source
1	4 Nov	Existing State Examination	PS98:2
2	25 Nov	RFPs	PS98:3
3	16 Dec	FHD and DFDs	PS98:6
4	6 Jan	DBs and OO	PS98:9, PS04:1

The above dates may change during the course of the semester.

5 Assignments

There will be between three and five assignments during the course of the semester which will use the techniques and information discussed in the class. Roughly, the assignments will require the students to develop the following skills:

1. Design and execute questionnaires and interviews about an existing information system
2. Prepare a list of potential approaches based on market research and a justification for each
3. Prepare an RFP for a new or improved system
4. Produce DFDs using FHD, identify transactions, and produce a database schema and GUI based on them

The assignments will involve significant out-of-classroom work, including some market research, information gathering and analysis, and some coding. Each assignment may be executed in groups of up to 3 students.

More details of each assignment will be given during the course of the semester.

6 Recitation and Laboratory Work

Exercise sessions are a combination of recitation and hands on experimentation sessions. Students may ask questions during the session and the instructor will answer all questions and issues posed.

Some exercise sessions will include a laboratory assignment due at the end of the session. Some will include a laboratory assignment due at the beginning of the following lecture period. Any laboratory assignment will be based on material covered in previous lecture or readings, not new material. The laboratory assignments will not be taken into consideration in the final grade.

7 Attendance

Students are responsible for all material presented in class, recitation, and laboratory sessions, all assigned readings, and all material provided for additional reading out of class.

Attendance of lectures and targil sessions is expected and required for this course. As per College policy, a student who misses 20% or more of the lectures or targil sessions may not be permitted to take the final exam. Attendance will be taken from time to time, but will not be taken directly into consideration in the calculation of the course grade. Students who miss lectures do so at their own risk and expense and will be expected to make up missed material on their own.

Students who know they will be missing two or more lectures due to circumstances beyond their control should inform the instructor as soon as possible before or after the fact to prevent misunderstandings or problems at the end of the semester.

Students who miss a lecture or targil are recommended to contact their classmates to get notes or find out what material was covered. The course syllabus and web page will also indicate the material covered and have the slide sets presented at all lectures.

7.1 Decorum

Students who attend lecture are expected to give their full attention to the material. Talking on cellular phones, text messaging, or other disturbing behavior will not be tolerated. Students who need to speak on the phone during lecture time or are expecting urgent messages *must* leave the classroom quietly, conduct their business, and return when they can participate fully in the class.

Students must arrive to lectures **on time, within the first 5 minutes of class**. As per college policy, the instructor reserves the right to expel from the classroom any student who enters more than 5 minutes late for lecture or who is disturbing others.

8 Submissions

8.1 How to Submit Work

To ensure timely submission of projects and work, students **may only submit work via the Telem system or in person**. Materials sent via email risk being ignored or ungraded without consideration of their merits. Technical issues with the Telem software should be directed to the information technology support staff in Kinneret College who will address them in a timely manner.

8.2 Late Submission Policy

Students are expected to be on time with their assignments. Each assignment must be turned in by the date it is due.

Each student may turn in **one** assignment up to 7 days late without penalty. Subsequent assignments will be assessed a 20% penalty for up to 4 days late and a 30% penalty for up to 7 days late. After 7 days, any assignment will be accepted with a 60% penalty until January 24, the last day of classes in the semester, until the solutions are posted on line, or any date announced by the instructor.

Students who are called up to Miluim duty will have their assignment deadlines extended in accordance with college policy.

9 Exams

There will be a single exam at the end of the course. The final exam will be worth **60%** of the course grade and will be scheduled in accordance with the Mador Bechinot of Kinneret College. In accordance the School

of Engineering rules, the final will be three (3) hours long, will cover all of the material in the course, and is a required element of the course grade.

10 Grading

Final grades will be calculated by combining grades from homework, assignments, laboratory assignments, student lectures, and exams. The grades are weighted as follows:

4%	Quizzes
36%	Assignments
60%	Final Exam

The instructor will not address questions about specific individual grades during the lecture or review sessions. Students may contact the instructor *in person* during office hours or after the lecture/review sessions at the instructor's convenience.

Students may request a regrade for assignments using the regrade request form found on the course web site. The instructor will regrade the entire item submitted, without prejudice to the grade previously assigned to it.

11 Books

The books used for the class are listed in the bibliography: Shoval 1998 [5], Shoval 2004 [6], Fowler 1995 [1], and Irani and Love 2008 [3]. The first two books are in Hebrew. The second two are in English.

The library will have copies of the books listed, but students are **encouraged**, but not required, to purchase the books as needed.

Over the course of the semester more materials may be introduced by the instructor to augment the books listed. In such cases, the instructor will make every effort to ensure their availability in the library.

12 Cheating

Cheating of any sort will not be tolerated. Student collaboration is encouraged, but within limits as set forth in the college's rules on academic integrity. Any students caught cheating will be immediately referred to the office of the Deacon and may receive a failing grade for the course.

Cheating includes:

- Copying information, content, or verbatim text to answer questions, solutions, or aid in programming projects from other students, internet sites, books (other than the ones listed in the bibliography), other other unaffiliated individuals.
- Copying source code **without attribution** from other students, **web sites**, online repositories, text books, open source programs, or other unaffiliated individuals.
- Other forms of academic misconduct as described on the site: www.vpul.upenn.edu/osl/acadint.html or as reasonably assessed by the instructor, program head, or deacon.

13 Contact Information

Instructor: Michael J. May
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Office Hour: Monday 10am-11am or by appointment

References

- [1] Floyd J. Fowler. *Improving Survey Questions: Design and Evaluation*, volume 38 of *Applied Social Research Methods Series*. Sage Publications, 1995.
- [2] John D. Gould and Clayton Lewis. Designing for usability—key principles and what designers think. In *CHI '83: Proceedings of the SIGCHI conference on Human Factors in Computing Systems*, pages 50–53, New York, NY, USA, 1983. ACM.
- [3] Zahir Irani and Peter Love, editors. *Evaluating Information Systems*. Elsevier, first edition, 2008.
- [4] Raman Ramsin and Richard F. Paige. Process-centered review of object oriented software development methodologies. *ACM Comput. Surv.*, 40(1):1–89, 2008.
- [5] Peretz Shoval. *Planning, Analysis, and Design of Information Systems*, volume 1–3. The Open University of Israel, 1998.
- [6] Peretz Shoval. *Analysis and Design of Information Systems — Combining Processes and Objects*. The Open University of Israel, 2004.
- [7] Ian Sommerville. *Software Engineering*. Addison-Wesley, Essex, England, 8th edition, 2007.