

Syllabus for “Course 1-02-326: Database Systems Engineering” at Kinneret College

Instructor: Michael J. May

Semester 2 of 5770

1 Course Details

The course meets **11:00am – 1:00pm** on Sundays. The Targil for the course is **8:00am – 9:00am** on Tuesdays.

The course has **2** hours of lecture and **1** hour of Targil. The room for the course is Caravan 510. The room for the Targil is Computer Room 202 in the Sciences Building. The Targil will be run by Dan Koenig. He will be responsible for running the Targilim and assignments for the course, but the instructor will maintain overall responsibility for all material taught in the course and Targil sessions.

2 Prerequisites

The prerequisites for this course are “Course 1-02-322: Database Systems”, proficiency in programming in C#, and a working knowledge of SQL.

3 Overview

The following is the syllabus for “Database Systems Engineering” at Kinneret college in Semester 2 of 5769. The main book for the course, as listed below, is *Database Management Systems* by Raghu Ramakrishnan and Johannes Gehrke.

The course covers four advanced topics in database systems:

- Transaction Management: Checking for conflicts and recovering from failures
- Parallel and Distributed Databases: Architectures, Storage, Indexing, and Queries
 - Included in this is a discussion of query evaluation and indexing as necessary
- Object Oriented Databases: Abstract Data Types, Inheritance
- Data Warehousing

Each section will be given approximately 25% of the time for the course and will have a programming project associated with it.

We will use the Microsoft SQL Server database engine for class recitation. The Computer Room TBA will have the query engine application installed on all of the computers, **but it is highly recommended that you install a copy of the MS SQL Server 2005/2008 Express and MS SQL Server Management Studio 2005/2008 on your own computer.**

The course lectures are structured in the following way. The relevant chapters the Ramakrishnan and Gehrke (RG) book are listed in the indicated column. Material not covered well in the RG book may be

supplemented from papers or other sources as shown in the O column. The column will be updated during the course of the semester to reflect supplemental information included during the course of the semester as time permits.

4 Lecture Schedule

#	Date	Subject	RG	O
1	7 March	Review of Transaction Management	16.1–16.6	
2	14 March	View and Conflict Serializability	17.1	
3	21 March	Lock Management	17.2–17.3, 17.5	
4	11 April	Specialized Locking	17.5.1, 17.5.3, 17.6.3	
5	18 April	Crash Recovery (short)	16.7	
6	25 April	Intro to Parallel DBs, Parallelization	22.1–22.2	[1]
7	2 May	Parallelizing Queries, Indexes, Intro to Query Evaluation	8, 12	
8	9 May	Query Evaluation and Parallelizing Queries	12, 22.4	
9	16 May	OODBMS, ORDBMS	23.1–23.3	
10	23 May	Structured Data Types, Ops, Inheritance, Object Ids	23.3–23.6	
11	30 May	Decision Support, OLAP	25.1–25.3	
12	6 June	OLAP Queries	25.3–25.6.1	
13	13 June	OLAP Indexes, Data Warehousing	25.6–25.8	
14	23 June	Creating and Maintaining Materialized Views	25.8–25.10	

Since this is an advanced course, 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.

5 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 11:00-11:10am. There will be (a maximum of) one quiz during weeks 1–4, one between weeks 5–8, one between weeks 9–11, and one between weeks 12–14. 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 arrive in class after 11:10am will not be given the opportunity to take the quiz.

Quizzes are tentatively scheduled to take place on the following dates and on the following material:

#	Date	Topic	Source
1	21 March	Strict and Lock Protocols	17.1–17.2
2	9 May	Parallel DB Structures and Data Distribution	22.1–22.4
3	30 May	OODBMS	23.1–23.5
4	13 June	OLAP	25.1–25.5

The dates may be updated during the course of the semester as appropriate.

6 Programming Projects

There will be four large programming assignments during the course of the semester, one for each portion of the course. They will involve a fairly significant amount of programming.

Each project can be done in groups of up to three (3) students. Students are encouraged to work in groups since the programming projects.

More details of the projects will be distributed during the course of the semester.

7 Recitation and Laboratory Assignments

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.

8 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.

8.1 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.

9 Submissions

9.1 How to Submit Work

To ensure timely submission of projects and work, students may only submit work via one of the following mechanisms:

- the Telem system
- in person
- via email to the course address: `ise326@gmail`

Materials sent via email to any other address 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.

9.2 Late Submission Policy

Students are expected to be on time with their project submissions and 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.

10 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.

11 Exams

There will be a single exam at the end of the course. The final exam will be worth **80%** 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.

12 Grading

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

- 4% Quizzes
- 16% Programming Projects
- 80% 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 laboratory assignments, exams, or programming projects 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.

13 Books

The following book [2] is used for the class:

Ramakrishnan, Raghu and Johannes Gehrke. *Database Management Systems*. McGraw Hill. 3rd Edition (2003) or later.

The library has copies of the books listed, but students are encouraged to purchase the books as needed. A bibliography of the books and articles used in the course of the semester is shown below.

14 Contact Information

Instructor: Michael J. May

Email: mjmay@kinneret.ac.il

Office Hour: Wednesdays 11:00am – 12:00pm or by appointment

References

- [1] Alon Y. Levy, Anand Rajaraman, and Joann J. Ordille. Querying heterogeneous information sources using source descriptions. In *Proceedings of the 22nd VLDB Conference*, pages 251–262, Mumbai (Bombay), India, 1996.
- [2] Raghu Ramakrishnan and Johannes Gehrke. *Database Management Systems*. McGraw Hill, 3rd edition, 2003.