Advanced Database Systems Design

Fall Semester 2025

Course No	CS 632
Section	101
Title	Advanced Database Systems Design
Date and Time	Thursday: 6:00 – 8:50 PM, CKB 330
Prerequisites	CS 631 and good knowledge of programming in any modern high-level procedural programming language such as Python, Java, or C++.
Instructor	**Joann (Canan) Eren** Office: GITC 4414 Email: canan.eren@njit.edu Web page: https://people.njit.edu/faculty/ce85
Instructor Office Hours	Thursday: 4:00 -5:00 PM (Office hours are not valid on the Reading Day, during exam periods, holidays, and breaks) If you cannot meet my office hours, send me an email to schedule an appointment.

Description	The purpose of the course is to improve in programming in an Oracle environment, especially in PL/SQL, and to learn about different data models, such as objects, XML, and JSON.
	
	 This course has the following parts.
	     1) Review your SQL and learn more of it.
	     2) Learn PL/SQL.
	     3) Practical ETL (Extract-Transform-Load) of data.
	     4) Study of a few advanced topics on databases, such as XML, OODBs, Indexing, and Buffer tuning.
	     5) Regular expressions in Oracle SQL
	     6) Study JSON and No-SQL databases, especially MongoDB.

Course (learning) outcomes	At the end of the course, students will have a working knowledge of the following subjects and techniques: • PL/SQL as a "normal" language • PL/SQL accessing tables • Using Oracle SQL Developer for Oracle programming

	- Inserting etc. in PL/SQL - Extract-Transform-Load - Object-Oriented Modeling - Object-Oriented DBs - Objects in Oracle SQL - Object-Relational DBs - Triggers in PL/SQL - Regular expressions in Oracle SQL - HTML (brief) - Intro to XML - XML data insertion in Oracle SQL - Querying XML in Oracle SQL - Into to JSON - JSON in Oracle SQL - No-SQL databases, esp. MongoDB - Intro to MongoDB use - Indexing in Oracle and MongoDB Topics are subject to change or omission, depending on time.
Textbooks	**1) REQUIRED**: Oracle 10g Programming: A Primer (Paperback) by Rajshekhar Sunderraman Paperback: 438 pages Publisher: Addison Wesley; Copyright: 2008 ISBN: 0-321-46304-8 If there are not enough copies in the NJIT bookstore, then please get it at www.amazon.com or www.barnesandnoble.com. **2) WEB MATERIAL AND HANDOUTS:** There will be handouts and reading materials that can be found on the Web.
Grading Policy	**Exams**: There will be one midterm exam and one final exam. **Homework (= Project):** There will be four programming homework assignments covering all the material we study in the class. Late policies will be announced along with the assignments. *In general, there will be late penalties.* **Canvas Credit**

There will be Canvas Quizzes EVERY WEEK which you have to do at home. I will check EVERY WEEK whether you are keeping up with the quizzes.

By the end of the semester, if you did not do all the quizzes you will get an F in the class, even if you have passing grades on all exams and all homework.

If you do fall behind on the Canvas quizzes by three weeks I will send you a "Warning you will fail the course" message.

If you do Canvas quizzes late, you will not get points for them.
Even though you still have to do the old quizzes, because otherwise the system does not let you access the new quizzes.

Extra Credit
There will be **NO** way to get extra credit. Please don't ask.

Grading:
The assignments will be graded with points from the following maxima:

Midterm*:   100
Final Exam*:   200

Programming Homework 1: 50
Programming Homework 2: 50
Programming Homework 3: 50
Programming Homework 4: 50
Canvas Quiz Credit: 100
                          _____
Total   **600**

* Midterm and Final exams will most likely be done using the Lock Down Browser service.

Penalty Points:
I reserve the right to take penalty points off from students whose phones are ringing during an exam.

Letter Grade:
At the end of the semester, I will add up your total points and curve the results for the whole class. The department has voted on a stringent curve for all courses. Only the top 25% of the class should expect an A.

	Furthermore, up to 20% of the class may face a C+, C, or F. In my experience, students getting 550 out of 600 points tend to be in the top 25%, but this is **no guarantee** for the future. Also, note that most students typically get all the points on the Homework assignments. Thus your position in the curve and your class grade depend almost entirely on the exams. On the other hand, missing a single homework is highly likely to lower your grade at least by one letter grade. **Make-up Policy:** Exam makeup *after* missing the exam will be only allowed in extreme cases with written proof, e.g., hospital stay, car accident with police report, and similar. Exam makeup due to travel may or may not be approved ahead of time and **never** after the trip. As above, trips related to an extreme emergency, e.g., death in the family, will be allowed with written proof (death announcement in a newspaper or government death certificate with *official* English translation, if from a foreign country).
Computer Use	**The Department has a Bring Your Own Device Policy.** **If you do not own a laptop talk to the Department Chair (or take a different class.)** You have to get an AFS account (ID), if you don't have one. You will need a printer, Web access, AFS access, and a text editor (notepad will do). You will need fast internet access if you work from home. Media Services can be reached at (973) 596-3005. **Canvas:** We will use CANVAS. You will need to watch videos posted there and take quizzes there. **Oracle and SQL Developer:** You will use the Oracle database system and PL/SQL. PL/SQL is part of the normal Oracle distribution. Instructions about SQL Developer are in the class materials web page and I will talk about them in the lecture. **MongoDB**: We will use MongoDB. It is available at NJIT.

	Studio3T: We will use the Studio3T development environment as a frontend to MongoDB. The company is making it available for free to NJIT students. Find the information here: https://studio3t.com/discount/education **NJIT Passwords:** If there is an NJIT password problem, try this: http://myucid.njit.edu This is the UCID password reset. You need a DIFFERENT password for Oracle. How do you get that different password? Go to: http://myucid.njit.edu In order to work from home on Oracle you need to install VPN. See here: http://telecom.njit.edu/vpn/ The computer we are using is called **prophet.njit.edu** The connection identifier that you will be asked for is **course**. Furthermore, you can get extensive explanations of the ORACLE setup by going to: http://ist.njit.edu/support/db/oracle.php **RESPONDUS:** We will use the Respondus Lockdown Browser as needed.
Academic Support System	**NJIT Academic Calendar:** **https://www5.njit.edu/registrar/calendars/** **This contains drop/add and other important dates.** **Resources for NJIT Online Students** IST Service Desk The IST Service Desk is the central hub for computing information and first point of contact for getting help and reporting issues related to computing technology at NJIT. Students can put in a ticket with the service desk: https://servicedesk.njit.edu/CherwellPortal/IST or call (973) 596-2900 Monday - Friday from 8:00am – 9:00pm

[Academic Advising Success Center](#)

"...assist in the advisement of students who are undecided in their major, transitioning into another major at NJIT, and those students who need additional support to graduate successfully and in a timely manner."

[Academic Integrity](#)

"New Jersey Institute of Technology is an institution dedicated to the pursuit of knowledge through teaching and research. The university expects that its graduates will assume positions of leadership within their professions and communities. Within this context, the university strives to develop and maintain a high level of ethics and honesty among all members of its community. Imperative to this goal is the commitment to truth and academic integrity. This commitment is confirmed in this NJIT University Code on Academic Integrity."

[Academic Support and Student Affairs](#)

"From questions about becoming a student at NJIT – to student engagement – to searching for information on career development, the Division of Academic Support and Student Affairs Staff is here to help."

[Additional Tutoring Centers](#)
[The Writing Center](#)

[Bookstore](#)

NJIT has a bookstore. Please check its web page how COVID is affecting operations.

[Canvas Help Page](#)

Canvas support for students.

[Center for Counseling and Psychological Services](#)

"The NJIT Center for Counseling and Psychological Services (C-CAPS) is committed to assisting students in the achievement of their academic goals as

	well as benefiting from their personal experience on campus. College life can be personally challenging and stressful at times. We believe that the educational process is an important component of the development of the individual as a whole person. Our goal is to optimize the college experience and improve the quality of the lives of our students by promoting their mental health and facilitating students' personal, academic and professional growth."
	The Learning Center "Our mission is to assist students both in the classroom and beyond by providing tutorial services, academic coaching, academic and personal enrichment workshops and staff and peer support so students can meet the demands of their coursework and are prepared for life after graduation." **Robert W. Van Houten Library** "The Van Houten Library offers electronic and print resources essential to the mission of New Jersey's science and technology university, including a core collection of academic books, databases, and journals, as well as research and consultation services." **Student Disability Services** "The Disability Support Services office works in partnership with administrators, faculty and staff to provide reasonable accommodations and support services for students with disabilities that have provided our office with documentation to receive services." **Student Financial Aid Services** "Student Financial Aid Services (SFAS) at NJIT is committed to providing you with every opportunity to obtain funding to support your undergraduate educational costs at NJIT."
Cheating	*"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 at:* *http://www5.njit.edu/policies/sites/policies/files/academic-integritycode.pdf.*

| | *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.** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at* dos@njit.edu*"*

You may "talk" about Homework assignments with each other. Where does talking end and cheating start? You may NOT copy lines of code from anybody. You may NOT use code in your program where you don't understand WHY it works, even if it works, and even if you wrote it yourself. |