CIS 444 – Spring 2022
Advanced Database Applications

Instructor: Robert S. Dollinger   **Zoom Sessions:** Mon, Wed 2:00 pm - 3:50 pm
Office: B229 Science
Email: rdolling@uwsp.edu

Administrative Information

Text Rental
NA

Website Resources
http://www.cs.wisc.edu/~dbbook/openAccess/thirdEdition/slides/slides3ed.html
http://www.cs.wisc.edu/~dbbook/dbbook.access.html

Optional Supplemental Texts [Would have to be purchased or downloaded]

Vaisman, Alejandro; Zimanyi, Esteban; *Data Warehouse Systems: Design and Implementation*, Springer 2014,

Kimball, Ralph et all; *The Kimball Group Reader: Relentlessly Practical Tools for Data Warehousing and Business Intelligence, Remastered Collection*, Wiley, 2016

Root, Randal; Mason, Caryn; *Pro SQL Server 2012 BI Solutions*, APress, 2012

Ponniah, Paulraj; *Data Warehousing, Fundamentals For IT Professionals – Secondh Edition*, JohnWiley and Sons, 2010

Golfarelli, Mateo; Rizzi, Stefano; – *Data Warehouse Design – Modern Principles and Methodologies*, McGraw Hill, 2009

Steven Feuerstein *Oracle PL/SQL Programming – Fourth Edition*, O'Reilly, 2005

Elmasri, Ramez; Navathe B. Shamkant. *Fundamentals of Database Systems*, Third Edition, Addison-Wesley, 2000.

Canvas
Look for CIS 444 site.

Attendance
Regular attendance is recommended and important due to practical work that will be performed during classes. Zoom sessions will be recorded and posted on Canvas.

Grades
Homework Assignments:
- To receive full credit, assignments must be handed in on time.
- **To be acceptable for grading, they must be neat, readable, and professional looking. Assignments that fail to do so will be assigned a score of zero.**
- Assignments are due on assigned dates. No late assignments.
- Missing assignments will receive a grade of 0.

Testing: [**No make-up exams will be given**]
Weekly classroom assignments.
A comprehensive final as scheduled (5/19/2022, Thursday 12:30PM - 2:30PM).

30%	Quizzes	10%	Extra Work
30%	Labs	10%	Course Participation
30%	Final Exam		

Cut-off percentages

		B+ 86.5%	C+ 76.5%	D+ 66.5%	F	Below 62.5%
A	92.5%	B 82.5%	C 72.5%	D 62.5%		
A-	89.5%	B- 79.5%	C- 69.5%			

*Flexibility in the above grading criteria will be provided by various opportunities for make-up and extra work such that interested and dedicated students may always have the chance of improving their final grade.

Working with DBMSs

The working DBMS is MS SQL Server.

You can choose to work at home as well by installing a free release of the above DBMS or by remotely connecting to a UWSP workstation. Server name and student's accounts will be communicated in the classroom.

Course Objectives

Understand advanced database management and application development techniques.

Course Topics

Server side advanced database programming (MSSQL):
- control flow statements;
- server cursors;
- stored procedures and user defined functions;
- triggers;

Database query optimization techniques:
- using database table indexes;
- analyze and use query plan;
- index selectivity;
- column stores;

Data warehousing and OLAP techniques:
- DW functions;
- DW structure;
- DW and DM architectures;
- redesigning the schema;
- multi-dimensional model;
- cubes and cuboids;
- special query techniques;
- MDX Queries;
- Time Series Queries with MDX

(Tentative)

XML Support in Modern DBMSs (MSSQL 2014)
- the XML Data type and its properties (un-typed and typed XML, impact of namespaces);
- FOR XML Clause (RAW, AUTO, EXPLICIT, PATH)
- OPENXML;
- XPath;
- XQuery;

LINQ
- LINQ to Objects;
- LINQ to SQL;
- LINQ to XML;

MSSQL 2014 and .NET Integration:
- developing CLR stored procedures;
- developing CLR functions;
- developing CLR types.

Concurrency control:
- insuring safety and consistency of multiple simultaneous user accesses;

Transaction processing:
- supporting e-commerce applications;

Database backup and recovery:
- database logs and check-pointing;
- rebuilding databases after catastrophic events;

Database administration and security:
-   users;
-   roles;
-   authentication;
-   grant and revoke privileges;
-   SQL vulnerabilities;

Office Hours Policy

Will schedule Zoom sessions as appropriate.

Email

You can use email for shorter, immediate and specific questions. Good chance to get a response the same day.

Don't use email for asking favors or announcing that you are sick!!!

Academic Misconduct Policy

See: http://www.uwsp.edu/dos/Documents/CommunityRights.pdf#page=11

Student Rights and Responsibilities

See: http://www.uwsp.edu/dos/Documents/CommunityRights.pdf.

In an Emergency:

- In the event of a medical emergency, call 911 or use red emergency phone located to the right of the pendulum in the 2nd floor hallway of the Science Building. Offer assistance if trained and willing to do so. Guide emergency responders to victim.
- In the event of a tornado warning, proceed to the lowest level interior room without window exposure on the first floor lavatory in the Science Building. If time or space do not allow, go to A224 or A225 Science Building or remain in the hallways around those classrooms. See http://www.uwsp.edu/rmgt/Pages/em/procedures/other/floor-plans.aspx for floor plans showing severe weather shelters on campus. Avoid wide-span rooms and buildings.
- In the event of a fire alarm, evacuate the building in a calm manner. Meet at the far end of Lot X where the driveway enters Lot X. Notify instructor or emergency command personnel of any missing individuals.
- Active Shooter – Run/Escape, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Follow instructions of emergency responders.
- Watch the Active Shooter video at: https://campus.uwsp.edu/sites/rmgt/campus/SitePages/Shots%20Fired%20-%20Lightning%20Strikes.aspx
- Watch the Preventing Violence video at: https://campus.uwsp.edu/sites/rmgt/campus/SitePages/Flashpoint%20on%20Campus.aspx
- See UW-Stevens Point Emergency Management Plan at www.uwsp.edu/rmgt for details on all emergency response at UW-Stevens Point.