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UNIVERSITY OF WISCONSIN-MILWAUKEE
School of Information Studies

INFOST 785 – Database Management for Information Professionals
Section 201 - Online
Fall 2019

SYLLABUS

Instructor: **Margaret Kipp**
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CATALOG DESCRIPTION

Introduces fundamental concepts and practical techniques of database management systems. 3 credits

GENERAL DESCRIPTION

This course provides an introduction to database management. We will cover theoretical and practical details of two major relational databases (Access and MySQL) and examine some of the more popular NoSQL database models including: key-value, document, columnar, graph and time series.

PREREQUISITES

- Graduate Standing.
- Basic computer facility and technology literacy as listed in the SOIS policy are required: http://uwm.edu/informationstudies/academics/graduate/mlis/?target=curriculum/#computer-literacy
- Prior experience with Excel or a similar spreadsheet is useful but not required.

OBJECTIVES/OUTCOMES

Upon completion of the course, students will be able to:

1. articulate important concepts in database management of various types of database; **(RDBMS Concepts Quiz, NoSQL Concepts Quiz)**
2. create a data model for RDBMS and other database types; **(Data Modelling, NoSQL Data Models, Project, In-Class Exercises)**
3. create a database from a list of entities or a data model; **(Creating an Access Database, Creating a MySQL Database, In-Class Exercises)**
4. critically evaluate database management systems for specific projects; **(NoSQL Data Models, Project, In-Class Exercises)**
5. address multilingual and multicultural issues in database creation and maintenance; **(Readings and Discussions, In-Class Exercises)**
6. identify emerging trends and stay current with issues in database management. **(NoSQL Concepts Quiz, Readings and Discussions)**

ALA COMPETENCIES (for MLIS students)

1. 3B. The developmental, descriptive, and evaluative skills needed to organize recorded knowledge and information resources.
2. 4A. Information, communication, assistive, and related technologies as they affect the resources, service delivery, and uses of libraries and other information agencies.
3. 4B. The application of information, communication, assistive, and related technology and tools consistent with professional ethics and prevailing service norms and applications.
4. 4C. The methods of assessing and evaluating the specifications, efficacy, and cost efficiency of technology-based products and services.
5. 4D. The principles and techniques necessary to identify and analyse emerging technologies and innovations in order to recognize and implement relevant technological improvements.

METHOD

Lecture/Discussion/Readings/Examples/Exercises – to achieve a satisfactory understanding of the course material and to fulfil requirements of the assignments, students are expected to attend the lectures, read and comment on the readings, participate in discussions and in-class exercises, and explore examples and tutorials.

TIME COMMITMENT

This course requires a weekly time commitment. General university guidelines indicate that a 3 credit course requires a minimum 144 hour time commitment over the course of a term. This time commitment represents a minimum of 9-10 hours of work per week per course. For an on-site class 3 of these hours represent on-site instruction in a classroom; in an online class this time would be spent on independent reading, discussions and in-class exercises.

Each week you may be required to read notes and readings from the reading list associated with that class, participate in discussions, write summaries of readings, complete in-class exercises, explore examples, or complete assignments and projects. It is your responsibility to plan your time in order to complete all activities based on the schedule outlined in this syllabus.

ACCOMMODATIONS

If you need accommodations due to illness, disabilities, scheduling conflicts with religious observances, or other life events (e.g. military service) contact the instructor as soon as possible, preferably by the third week of class as per university policy. Official documentation may be required depending on the nature of the considerations requested per university policy (http://www4.uwm.edu/secu/docs/faculty/1895R5_Uniform_abus_Policy.pdf).

TEXTBOOK AND READINGS

Watt, Adrienne and Eng, Neslon. 2014. Database Design 2nd Edition. BCcampus https://opentextbc.ca/dbdesign01/ [Open Textbook]

McFadyen, Ron. 2016. Microsoft Access and Relational Databases 3rd Edition. http://www.acs.uwinnipeg.ca/rmcfadyen/CreativeCommons/ [Open Textbook, scroll to the textbook link, you may wish to download the accompanying database files from the website as well]

Sadalge, Pramod J. and Fowler, Martin. 2013. NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence. Addison Wesley. (Available in Paperback, Kindle, EPUB, etc.) ISBN-13: 978-0321826626 [Required]

Kandhare, Devram & Ploetz, Aaron & Kadambi, Sudarshan & Wu, Xun (Brian). 2018. Seven NoSQL Databases in a Week: Get Up and Running With the Fundamentals and Functionalities of Seven of the Most Popular NoSQL Databases. Packt. (Available in Paperback, Kindle, EPUB, etc.) ISBN: 978-1787288867 [Optional. Recommended for practical experience]

Readings are listed in the course outline for each class. Readings should be completed before the class. Other course materials, including this syllabus, are available through Canvas (https://uwm.edu/canvas/home/).

COURSE OUTLINE

Class	Date	Topics	Readings (complete before class)	Exercises
1	Sept 3	Introduction to Databases; RDBMS Concepts	• Watt and Eng. Chapters 1-7 • McFadyen. Chapters 1-2.	• Creating an Access Database
2	Sept 10	E-R Modelling and Database Development	• Watt and Eng. Chapters 8-9, 13, Appendix A • McFadyen. Chapters 7-8.	• E-R Model • Creating a DB from an E-R Model
3	Sept 17	Normalisation	• Watt and Eng. Chapters 10-12, Appendix B • McFadyen. Chapter 10.	• Normalisation
4	Sept 24	Forms and Querying	• McFadyen. Chapters 3-6.	• Forms • Querying
5	Oct 1	Access SQL and MySQL	• Watt and Eng. Chapters 15, Appendix C • McFadyen. Chapter 9.	• SQL in Access (DML) • Creating a MySQL Database (DDL and DML)
6	Oct 8	Advanced SQL	• Watt and Eng. Chapters 16, Appendix C	• Advanced SQL, Subqueries and Joins
7	Oct 15	Reports and Views; Transactions and Data Integrity; Internationalisation	• Watt and Eng. Chapter 9. • http://www.vertabelo.com/blog/technical-articles/data-modeling-for-multiple-languages-how-to-design-a-localization-ready-system; • https://tomharrisonjr.com/design-for-localization-	• Reports • Views • Transactions (TCL) • Internationalisation (i18n)

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8	Oct 22	Administration and Security; ODBC and Web Data Access	• Watt and Eng. Chapter 14. • What is ODBC? https://www.simba.com/resources/odbc/; • 13 Data Security Essentials http://www.dbta.com/Editorial/Think-About-It/13-Data-Security-Essentials-110187.aspx; • SQL Injection Attacks by Example http://www.unixwiz.net/techtips/sql-injection.html;	• Backups, Replication and Data Dumps • Import and Export • Security (DCL) • ODBC and Web Data
9	Oct 29	Triggers, Cursors and Stored Procedures	• http://www.mysqltutorial.org/mysql-stored-procedure-tutorial.aspx; • http://www.mysqltutorial.org/mysql-cursor/; • http://www.mysqltutorial.org/mysql-triggers.aspx;	• Triggers, Cursors, Stored Procedures
10	Nov 5	Introduction to NoSQL Databases	• Sadalge & Fowler. Part 1 • Optional: Seven NoSQL Databases. Chapter 1	
11	Nov 12	Key-Value Databases; Document Databases	• Sadalge & Fowler. Part 2: Chapters 8-9 • Optional: Seven NoSQL Databases. Chapters 2 (doc), 4 (key-value)	• Key-Value Model • Document Model
12	Nov 19	Column Databases; Graph Databases	• Sadalge & Fowler. Part 2: Chapters 10-11. • Optional: Seven NoSQL Databases. Chapters 3 (graph), 5 & 6 (column)	• Column Model • Graph Model
13	Nov 26	Thanksgiving - No Class	• No Readings	
14	Dec 3	Time Series Databases; Choosing a DBMS	• Sadalge & Fowler. Part 2: Chapters 12-15 • Optional: Seven NoSQL Databases. Chapter 8 (time) • https://blog.timescale.com/what-the-heck-is-time-series-data-and-why-do-	• Time Series Model • Choosing a DBMS

			i-need-a-time-series-database-dcf3b1b18563	
15	Dec 10	Wrapup (Jobs and Current Trends)	• http://www.micoresolutions.com/current-trends-database-management/; • http://www.odbms.org/blog/2018/03/on-rdbms-nosql-and-newsql-databases-interview-with-john-ryan/; • http://dataconomy.com/2015/08/sql-vs-nosql-vs-newsql-finding-the-right-solution/;	• Compare RDBMS, NoSQL, NewSQL databases

ASSIGNMENTS

Assignment	Graduate	Associated Classes	Deadline
Creating an Access Database [1] Create a simple database in Access based on one of the narratives provided. Add relationships (keys) and at least one record per table.	5	1	Class 3 [2]
Data Modelling Create a normalized (3NF) E-R model, showing entities, attributes and relationships, based on one of the narratives provided. Create an Access Database using this E-R model. Be sure to include all entities, attributes and relationships from the model in your database as well as a narrative describing your normalisation process. (Note: If you wish to design a different database email me to discuss.)	10	2-3	Class 5
Creating a MySQL Database Create a MySQL database using the previously selected narrative from Data Modelling.	5	4-5	Class 6
SQL Create a set of 4 queries to retrieve information from your previously created Access or MySQL database. Two of the queries must contain joins or subqueries for full points.	10	4-7	Class 8
Transactions and Security Discuss methods covered in this course which can be used to manage data integrity and security in an RDBMS. Provide examples of specific commands or screenshots of specific settings from Access or MySQL to illustrate your points. (600 words)	5	7-8	Class 9
RDBMS Concepts Quiz This quiz will allow you to demonstrate your	2.5	1-9	Class 9

understanding of important RDBMS concepts.			
NoSQL Concepts Quiz This quiz will allow you to demonstrate your understanding of important NoSQL concepts.	2.5	10	Class 11
NoSQL Data Models Create a data model for one of the given scenarios. Justify your choices using elements of databases covered in this course and the readings. (600 words)	15	11-12	Class 13
Project Select a scenario from those provided and design a database to store the data. Choose a suitable database system based on the information discussed in this course, design the data model for the data and create a basic database, E-R diagram, or data model as appropriate for the data and chosen database type. Write a report justifying your choice of database, data model and any other design decisions. (800-1000 words or equivalent, charts, tables, database files, screenshots, etc. do not count towards the word limit)	30	All	Project: Last class
Participation (see below)	15	All	Last class
Total	100		

[1] Full assignment descriptions are in Canvas.
[2] Class numbers are listed in the Course Outline Table. Each class has an associated Class Number (#), Date, Topic, Readings and may have In-class Exercises, Discussions or Tutorials. The assignment table is keyed to the course outline's class numbers. To determine the exact date an assignment is due, go to the appropriate class number in the course outline table or use the Canvas calendar.

Participation
Students are expected to participate in discussion and in-class exercises as a demonstration of their ability to articulate key concepts. Participation is mandatory and constitutes almost one quarter of the points available for this class. Participation will consist of all of the following: individual summaries of readings, participation in discussions, contributed articles, and responses to others.

Participation will consist of all of the following:

- **Completion of the Syllabus Quiz**
  - The syllabus quiz must be completed in the first 2 weeks of class. Points will automatically be entered in Canvas.
- **Individual Summaries of Readings**
  - Post 3 summaries of the weekly readings to the appropriate discussion group based on the class associated with each reading.
  - You must post 3 summaries in total, but you may choose the classes for which you wish to contribute the summaries.
  - Sign up for 3 sets of readings on the signup sheet posted in the news section of Canvas.
  - Responses need not exceed 300 words.

    - Summaries posted before the date of the class earn a half bonus point each. Be sure to mark this on your course completion checklist to ensure you receive the bonus.
- **Contributed Article**
    - Contribution of a new article, video, cartoon, etc. relevant to the class and a short summary (approximately 100 words) explaining its relevance to class. This should be posted to the appropriate discussion group based on the topic. You may choose which week you wish to contribute this item.
    - A signup sheet will be posted in the news section of Canvas.
- **Individual Summaries of In-Class Exercises**
    - Participation in the in-class exercises included in most weeks. Post individual summaries to the appropriate discussion group.
    - You must post 6 summaries of in-class exercises in total, but you may choose the classes for which you wish to contribute the summaries.
    - Responses need not exceed 300 words.
- **Participation in Weekly Discussions**
    - Participation in weekly discussions including responding to discussion prompts and reading and/or responding to weekly reading summaries and other information posted to the discussion groups by classmates. Points will be allocated based on your posting level (i.e. many, few, nothing) and/or your responses to others (i.e. many, few, no responses).
    - Generally frequent participation requires that you participate at least once a week in most weeks.
- **Submission of the Course Checklist to the participation dropbox**
    - The completed checklist with all required course elements listed submitted to the dropbox before the last class. You should complete as much as possible of the checklist. Use the checklist throughout the term to ensure you are on track to complete all course requirements.

All participation components should be posted to the appropriate discussion group before it closes.

Working with Classmates
All assignments except the quizzes and participation may be completed in pairs or trios. Assignments completed in pairs/trios must identify all work partners by full name at the top of the assignment. You must each submit the same assignment to the dropbox. If you simply assisted each other but did not do the whole assignment together, you must also note this at the top of the assignment. Unacknowledged borrowing is seen as academic misconduct, so be sure to document your teamwork to avoid this.

Formatting Guidelines for Assignments
Assignments should be written using Arial or another Sans-Serif style font. Do not use red text or highlights for emphasis or to highlight your answers to questions. Remove all extraneous information before submission (e.g. assignment instructions or tips).

Use whatever citation format you prefer. If you are not using a common format such as MLA or APA you should include information about which style guide you are using in the assignment.

Paper submissions will not be accepted. All assignments must be typed on a computer and submitted electronically. Handwritten submissions will not be accepted, even if scanned and submitted electronically.

Assignments may not be submitted in Pages, Microsoft Works, or Microsoft Project as I cannot open these formats. You should save these as a PDF instead. Other common file formats should be acceptable including Open/Libre Office formats. If you are using an unusual format you can always check with me first before submission to ensure I can open it.

Due Dates and Assignment Submission
All assignments and projects should be submitted through Canvas to the appropriate dropbox before midnight (Central Time) on the due date. Points for late assignments will be reduced 10% per day late after the due date. The dropbox will remain open for the submission of late assignments until the late penalty reaches 100%.

Participation items, including in-class exercises, should be submitted to the appropriate discussion group (see the participation section below) before the discussion group closes. Discussion groups will be open for 1 week before and 1 week after the date of the associated class.

Emailed submissions will only be accepted as a backup to a Canvas submission (or in case of Canvas errors).

Everything must be submitted by the Last Class (this includes all assignments, papers, projects, and participation). All project and assignment deadlines are in the syllabus. For discussion deadlines check the discussion groups or the Canvas calendar. The Canvas calendar also contains all project and assignments deadlines. It is your responsibility to keep track of deadlines using the tools provided or by creating your own list of deadlines.

Items submitted early will not be evaluated until their due date. Students are encouraged to complete all Associated Classes listed under Assignments before submitting the assignments since the material in these classes constitutes preparation for the assignments. Submission well before the due date is not encouraged.

Extensions
Students must contact the instructor before each due date for any extensions. Extension requests made prior to the due date do not require any documentation or explanation as long as they are not longer than a week. Simply provide a date/time by which you will submit the assignment. After the deadline the penalties listed under Due Dates will be enforced. Material submitted late after an extension will also be subject to these penalties. Plan your time accordingly.

Technical Issues
You are responsible for accessing tools used in this class in a timely manner in order to complete in-class exercises and assignments. This course assumes you have the required basic computer facility and technology literacy skills as listed in the SOIS policy. Technical issues do not absolve you from the requirement to complete material. If you are having technical issues, you should switch to Firefox as a first step. You may also find the tools do not work from your work place, in which case you should try them from home or on the school

machines. I will attempt to provide technical assistance with common problems, but you can also contact the UWM Help Desk (https://uwm.edu/technology/help/) for assistance with technical issues.

Extra Credit or Other Special Considerations
Per university policies (see http://www4.uwm.edu/secu/docs/other/S29%2Ehtm) extra credit assignments and other special consideration are not possible. Students should make use of the extensions policy outlined above or provide appropriate documentation of special circumstances as outlined elsewhere in the syllabus.

Code of Conduct/Expectations for this Class
This is a professional programme and professional, courteous behaviour is expected of all participants. It is expected that class members will show consideration for all other members of the class and contribute in a constructive manner which is conducive to a good learning environment. Class members should consider the relevance and appropriateness of their contributions to the class before contributing to the class. Violations of these expectations will result in reduced participation points or other sanctions depending on severity.

Plagiarism and Referencing
Plagiarism is the unacknowledged borrowing of ideas or material from someone else's work. It is considered an academic offence and can be considered grounds for failure in a course or expulsion from the programme. Cite all references and provide credit for all other materials. This applies to all material including images, sounds or videos. A citation (in the format of your choice) with a functioning URL (if relevant) is the minimum required for a reference. (http://guides.library.uwm.edu/content.php?pid=235714&sid=1949820#6509804)

You may not resubmit assignments already submitted in other courses or in a previous instance of this course, nor may you submit other people's work as your own. Plagiarism will be dealt with on a case by case basis but will result in a lowered mark on the assignment, failure on the assignment or failure in the course depending on severity and the number of plagiarized items submitted. Points lost through plagiarism may not be replaced by bonus points on other assignments.

It is expected that you will consult and cite the research and professional literature where merited and not rely solely on encyclopaedias, newspapers or unpublished, online sources. Papers where the majority of sources are blogs and Wikipedia (or similar sites) will not be accepted.

Use a common style manual for citations (e.g. APA, MLA, Chicago). Ideally you would choose a citation style guide you have used before, or one you are using in another class.

GRADING SCALE

96-100	A	Superior work		74-76	C	Work is below standard
91-95	A-			70-73	C-	
87-90	B+			67-69	D+	
84-86	B	Satisfactory, but undistinguished work		64-66	D	Unsatisfactory work
80-83	B-			60-63	D-	
77-79	C+			Below 60	F	

GRADE REQUIREMENT FOR A CORE COURSE
If you are pursuing an MSIST degree or an MLIS IO or IT Concentration, you need to earn at least a B (does not include B-) in this course.

UWM AND SOIS ACADEMIC POLICIES
The following link will take you to UWM pages/links which contain university policies affecting all UWM students. http://uwm.edu/secu/wp-content/uploads/sites/122/2016/12/Syllabus-Links.pdf
The following link will take you to pages/links which contain SOIS policies affecting all SOIS students. http://www4.uwm.edu/sois/resources/formpol/policies.cfm
Undergraduates may also find the *Panther Planner and Undergraduate Student Handbook* useful. http://uwm.edu/studenthandbook/
For graduate students, there are additional guidelines from the Graduate School. http://uwm.edu/graduateschool/