Course Info

Winter 2018 ● CRN 21069 ● Tue/Thurs 6:00-8:15pm
30 sessions (Discussion/Lab mix) ● TTC Room 2350 (Comp. Lab)

Prerequisites: CIS 175 DataBase/SQL

Course Description: This hands-on course will advance students' knowledge and experiences with database queries, maintenance using SQL and Oracle. Emphasis will be on advanced database design, uses and architectures along with data security, DBMS installations, business intelligence, web technologies, and data mining.

Learning Objectives

- Design and Create advanced database table relationships and normalize to 4NF (Normal Form) using large scale table structures and data importing and transitioning from one data model to another.
- Maintain, Optimize Queries and complete Performance Tuning with advanced relationships using SQL and Oracle to include indexing, functions, stored procedures, sub queries
- Compare and contrast SQL and Oracle, Open Source DBMS and 3rd party management tools
- Complete Transaction Management and Concurrency Controls
- Fully understand security concerns
- Implement security procedures with queries and maintenance
- Perform installations of Oracle and SQL
- Perform database connectivity and web technologies
- Understand and create an awareness of database architectures and uses beyond relational, such as Distributed DBMS, Warehousing, Cube Technologies, including current trends in DBMS, along Business Intelligence concepts.

General Education Outcomes

- Effective written and oral communication
- Ability to think critically and to solve problems
- Information, numeric, and technology literacy
- A highly developed sense of ethics
- Strong personal management skills

Textbook: SQL, Database Design (one … but all suggested)

- *Database Design for Mere Mortals (John L. Viescas, Michael J. Hernandez)*
- *SQL Queries for Mere Mortals (Michael J. Hernandez)*
- *Oracle SQL and PL/SQL (Joel Murach)*

Project Readings:

- Business Intelligence Concepts (read all)
  - Blue Granite Resources: https://www.blue-granite.com/resources
    - 5-reasons-to-get-excited-about-sql-server-2016-and-big-data
    - built-in-analytics-why-r-matters-to-a-sql-server-professional
  - http://en.wikipedia.org/wiki/Business_intelligence
  - http://mahedee.net/basic-concepts-of-business-intelligence-bi/
- Data Mining (read all)
  - http://msdn.microsoft.com/en-us/library/ms174949.aspx
  - http://docs.oracle.com/cd/B28359_01/datamine.111/b28129/process.htm#DMCON002
  - http://en.wikipedia.org/wiki/Data_mining
- Alternate Database Systems (read all) - not only SQL, Warehousing, etc
  - http://en.wikipedia.org/wiki/NoSQL
  - https://aws.amazon.com/nosql/
  - 10-things/10-things-you-should-know-about-nosql-databases/

Instructor Info

Office: 7212
Campus email: jburns@kvcc.edu – (best contact method)
Campus phone: 269.488.4430 | **Voice mail:** 269.488.4701 ...extension 6142
Office hours: 5:30 to 6:00pm Tuesday/Thursday (or after class)

Available via email, possibly cell phone (will share if that will be useful)

Class Policies

- Cheating/Plagiarism - *Student Handbook (KVCC PDF) Page 17, Section II & III*
- Final Report
  - Must be turned-in, as scheduled.
  - Prior arrangements may be made - at the discretion of the instructor.
- Hand-in items due as defined in schedule, or via class session discussion
  - Occasionally, due dates "may be" modified due to snow day or other closures; however, in general – we are an electronic society – therefore hand-in via web/email is most likely alternate procedure

Grading

Attendance	30 sessions	
Project 1-4	75pts each	300pts - See "To Be Graded"
Quiz 1-10	10pts each	100pts - Class & Reading topics
Final Report	100 pts	100pts – Project 5
Final Exam	100 pts	100pts - Comprehensive
	Total Points	**600**

	Grade	Points	%
Outstanding	4.0	540-600	90-100
Excellent	3.5	510-539	85-89
Good	3.0	480-509	80-84
	2.5	450-479	75-79
	2.0	420-449	70-74
	1.5	390-419	65-69
	1.0	360-384	60-64
	0.0	0-359	0-59

Definitions

4.0... = someone that understands a majority of the subject matter for the course and can apply that knowledge to create a variety of well-written programs. They understand where to go to find additional information and how to weave-in that new knowledge. To an employer, this student is a self-starter and requires little, to no handholding.

3.5... = better than a 3.0 and less than a 4.0

3.0... = someone that understands the subject matter at a level below the 4.0, can apply most of the knowledge to create programs similar to those used within the course, and knows where to find additional information, but struggles at how it fits into their current knowledge. To an employer, this student will require some handholding over the first few months to a year as the student gains additional experience.

2.5... = better than a 2.0 and less than 3.0

2.0... = someone who struggles with the subject matter, fails to apply this knowledge to new programs, yet can work through course example programs if given enough time. This student relies completely on the instructor and course book and has not learned how to use external knowledge sources, nor how to apply that knowledge. The student is one who has had outside influences affecting focus on coursework, procrastinated, or just did not try. To an employer, this student would not be valuable in the subject-matter arena.

0.0, 1.0, or 1.5 ... This student should repeat the course.
Note: If maintaining a higher GPA is important to you - and your ability to do well in the course has been compromised, I highly recommend that you withdraw from the course before the cut-off period. Take the course again, when you are able to focus.

Summary of Graded Research Papers

The result of each project will be a research paper containing results of your learning work for each project. (see Project Grading Guidelines). *Full details will be provided in separate project documents, to be handed out at start of 2nd week of class.*

Projects:

1. Install of database engine(s)
   - You will need to review install steps, download appropriate files/programs, perform install (which may have after install steps required). Your research paper will need to inform the reader of the install cycle, and pitfalls you may run into.
2. Working Database
   - Install sample large database – Microsoft AdventureWorks for example
   - Analyze the structure and data contents, review stored queries (stored procedures), review reports, review security, normalization
   - Report on above analysis – what did you learn
3. 3rd Party Management Tools
   - Review several 3rd Party Management Tool provider websites; possibly install short-term versions, and read articles/whitepapers on the tool. Summarize each product and consider benefits and differences between them. Include costs to outfit your organization (consider costs based on organization having 1-5 developers/DB Admins and one that has 10-25 developers/DB Admins)
4. Alternate Database, Business Intelligence, Data Mining
   - Review links noted in Textbook section of this document.
   - Discuss each "section" – in summary fashion (do not copy/paste) – your goal is to report on each section w/o plagiarizing. "Callouts" are acceptable (with attribution) – but should be a small amount of your discussion. Highlight the content, and inform the reader about the section. Generally… describe what you learned about the section.
5. Final Report – 2 parts
   - Part #1 – collect "what you've learned" during the semester into a single document. Essentially… a summary of each of the above projects (1-4).
   - Part #2 – Pick one project and become a Subject Matter Expert on that content by finding additional content on the Internet – preferably "whitepapers" or "education documentation" (e.g. thesis) – not blog content. Pick 2 sources – summarize the content and what you learned that was not in the textbooks or links provided in the textbook section of this document.

Each of above should include technically informative detail. You may find having a few screen captures help to not only guide your detail, while enabling you to discuss specifics.

Project Grading Guidelines

For CIS275, the concept of a research paper is defined as:

- They are Not Step-by-Step guides
  - Help me know the work you completed
  - Do not include every screen you encounter
  - Ok to include "cropped" screen capture(s) which enable you to better explain the topic for any given paragraph/page
- Think: formal summaries of your work as you step through the assigned projects
- Consider your audience to be a co-worker with knowledge/skills similar to your own
- Likely never a single page; to properly inform the reader, each paper would likely be many pages. The goal is not about "filling out" 'x' number of pages – it is about providing good information, such that your reader will understand what you did, gain knowledge of issue points, and as a result - be efficient and productive.
- Should use common college paper formatting
  - 1" margins
  - Use common font-family: Arial, Calibri, Helvetica (or similar)
  - Font-size no larger than 12pt, smaller sizes are acceptable for "less important" text (example: captions of an image)
  - Title page: Project name/number, purpose, author, date
  - Headers/Footers optional – but should be appropriately applied (e.g. not on title page), and should provide value to the space taken on the page
- Content that relates to software versions – should have the version noted
- While not an English/Grammar course – you should be using a modern word processing program which performs basic checking
- Hand-In: Electronic (Word/PDF) & paper (signed by you). Pages stapled together (upper-left); they do not need binding/binders/fancy folders.

- While I encourage you to discuss the concepts with your classmates, the resulting papers are not group projects – Do Not Share Your Work
  - Any papers which come across as duplicates – will be zeroes for each
  - If you've worked with a classmate and that work is going to result in a specific paragraph being fairly similar – then treat it like the content came from elsewhere (see following)
- Content not your own (picked from the Internet/books) cannot be more than 10-15% of your paper. This content – if used, must have a reason for existing in your paper and therefore it should enhance your own content.
  - Identified using a note e.g. bibliography/footnote section
  - If your paper comes across to me as essentially a "copy/paste" with some words tossed about – it will be returned ungraded. Note: this will be costly if you run out of semester and unable to correct it.
- In general, if the paper needs work – no grade will be assigned. It will be returned. If there is enough time in the semester, please correct and hand-in for grading.

External References

Database Guidelines (representation of "sides")

- SO: SQL Naming Guidelines: http://stackoverflow.com/questions/7662/database-table-and-column-naming-conventions
- Code Project: http://www.codeproject.com/Articles/22947/A-Naming-Scheme-for-Database-Tables-and-Fields
- Blog: http://blog.sqlauthority.com/2007/06/04/sql-server-database-coding-standards-and-guidelines-part-1/
- Any number of others – search term: *database naming guidelines*

Programming/Development Guidelines

- Microsoft "Naming Guidelines": http://msdn.microsoft.com/en-us/library/xzf533w0(v=VS.71).aspx
- Microsoft "Guidelines for Names": http://msdn.microsoft.com/en-us/library/ms229002.aspx
- Microsoft "Working with Base Types": http://msdn.microsoft.com/en-us/library/7wchwf6k(v=VS.71).aspx
- Microsoft Search (UX guidelines): https://social.msdn.microsoft.com/Search/en-US?query=windows%20ux%20guidelines&ac=5
- Pete Brown: http://10rem.net/articles/net-naming-conventions-and-programming-standards---best-practices
- StackOverflow: http://stackoverflow.com/questions/181597/what-are-the-naming-guidelines-for-asp-net-controls
- Joel Spolsky: http://www.joelonsoftware.com/articles/Wrong.html

See references folder (e.g. Course folder tree), for more

Highly Recommended

- **Code Complete** - author's site, Amazon: Author's books
- **Clean Code** - author's site, Amazon: Author's books
- **Don't Make Me Think** - author's site, Amazon: Author's books

Class Schedule (subject to change)

January

Date	DOW	To Do	Details/Reference
9	T	Intros, Learning Community SQL Server Express Install/Setup (P1)	VM Drives
11	R	SQL Server Express Install/Setup continued	
16	T	SQL Review/Work Session	Quiz #1
18	R	SQL Review/Work Session	
23	T	SQL Review/Work Session	
25	R	Working Database (P2) Install AdventureWorks / Analysis	Quiz #2
30	T	SQL Review/Work Session	**Project #1 Due**

February

1	R	SQL Review/Work Session	Quiz #3
6	T	3rd Party Management Tools (P3)	
8	R	SQL Review/Work Session	Quiz #4 **Project #2 Due**
13	T	Application DB Connections (MS SQL)	
15	R	SQL Review/Work Session	
20	T	SQL Review/Work Session	
22	R	SQL Review/Work Session	Quiz #5-6
27	T	SQL Review/Work Session	

March

Date	DOW	To Do	Details/Reference
1	R	SQL Review/Work Session	**Project #3 Due**
6-8		*Spring Break - no class*	
13	T	Oracle Database Express/SQL Developer	Discuss P4 Items
15	R	Oracle Review/Work Session	Quiz #7
20	T	Oracle Review/Work Session	
22	R	Oracle Review/Work Session	
27	T	Oracle Review/Work Session	Quiz #8
29	R	Oracle Review/Work Session	

April

3	T	Oracle Review/Work Session	Quiz #9
5	R	Oracle Review/Work Session	**Project #4 Due**
10	T	Application DB Connections (Oracle)	Discuss P5 Items
12	R	Oracle Review/Work Session	
17	T	Oracle Review/Work Session	Quiz #10
19	R	Oracle Review/Work Session	
24	T	Work Session College IDEA Survey	**Project #5: Final Report Due**
26	R	Final Exam	Comprehensive

Semester officially ends on Monday May 1st (for MW courses)

Community Time

- AITP – Friday evenings Fall & Winter
- Kalamazoo X Conference –- http://kalamazoox.org/
- Other conferences Michigan - Dev Days/Nights, SQL Saturdays

Ethics

Electronic Class Attendance Report (E-CARs) occurs the 3rd week of class. I report participation in class based on active attendance and real effort. Do not ask me to help you commit fraud.

Attendance

I monitor attendance for the college. I do not award points for your attendance. Enhancing your learning… that is the reason you should attend class.

Can you learn without attending class? Some students can; however, your lack of attendance places a high burden on you to learn on-your-own. I have found through personal experience and also proven by students that less learning takes place, when students do not attend class. The amount of knowledge transferred in-class through discussion, demonstrations, and over-the-shoulder guidance is significant.

I do not teach this class via email and the short videos (if available) are not a replacement for your attendance and participation.

Make the decision to attend and participate in class!

Grading Plan

My goal in this course is that you learn the material.

Projects #1-5 have defined due dates. You must turn in each project by the due date, or take a zero for that project. After my review, if I believe the project is incomplete, I will give you another week to advance the project. Project 5 is dependent on Projects 1-4; therefore, you will need to have those projects completed in order to complete Project 5 (even if you did not complete one or more of them for a grade).

It doesn't make sense for you to continue to the next objective when you are struggling with a prior objective. However, the college semesters offer us a defined time period to complete the content; therefore, if you have not finished sections of work early in the semester, it does not make sense for you to take the final exam or complete the final project - without the knowledge to do so.

The Final Report (e.g. Project #5) has a required completion date. This means you will have only one opportunity to complete this graded requirement.

Course Book

See Textbooks & Readings

Commitment to Learning Community

I enjoy learning. I enjoy the entire atmosphere of learning. The new knowledge, the interactions, and the shared ideas. My goal is to foster a learning community.

You can learn by reading a book and then trial-error your way to a solution. Over time you will likely "get it". However, you will find that when you participate in a learning community... the time to "get it", is significantly less.

A quality work environment is a learning community. Sharing amongst peers can help you reach goals, seek new ideas, or spur new learning & work opportunities.

Each student should seek out learning communities - one which each participant can and will interact with others in the community. It is these interactions and sharing of ideas which will enable the greatest amount of learning to occur.

Support

Many of us may not have learned... *how to learn*. Sometimes the course material really stumps us. What is a struggling student to do? The college offers many resources to help struggling students. Our goal is that you succeed. However, it really is up to the student to seek out assistance.

Be Realistic

1. The sooner the better - most learning is cumulative - you need to know first parts, to continue to later parts
2. Missing (or skipping) classes and then trying to catch up is very frustrating, as you realize how difficult it is to recover lost time

Instructor

Speak with your instructor. Really! I would be glad to help you find what it takes to turn the light bulb on as you learn the course material. If you're not "getting it" in class, then let's arrange a time outside of class, so we can figure it out.

Class Network

Network with your classmates. Successful students work together to learn. Work this network!

Student Success Center

A great place to become familiar with, before you need help. The place to go if you need extensive help. Arrange *one-on-one* tutoring, information about "how-to-study", reading assistance, etc.