## 

CSC 384-01, Data Base Design (3 credits)

Winter 2021

Course Syllabus

#### Course Information

#### **Jan 19, 2021 to Apr 20, 2021**

#### **Course Web Page:** [**http://bb.umflint.edu**](http://bb.umflint.edu) **(all class material)**

#### **Lecture: Mondays, Wednesdays 11:00 – 12:15**

**Zoom info for lectures:** URL: <https://umich.zoom.us/j/92380342313>

(or) Zoom client: Meeting ID: 92380342313

(or) One tap mobile: +16468769923,,92380342313# US (New York)

(or) Dial by your location: +1 646 876 9923 US (New York) and enter Meeting ID

#### **Pre-requisites:** [CSC 275](http://catalog.umflint.edu/search_advanced.php?cur_cat_oid=28&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=3&filter%5Bkeyword%5D=CSC+384#tt6413) or [CSC 276](http://catalog.umflint.edu/search_advanced.php?cur_cat_oid=28&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=3&filter%5Bkeyword%5D=CSC+384#tt8666) with a grade of C (2.0) or better, or [CSC 175](http://catalog.umflint.edu/search_advanced.php?cur_cat_oid=28&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=3&filter%5Bkeyword%5D=CSC+384#tt9917) and [HCR 301](http://catalog.umflint.edu/search_advanced.php?cur_cat_oid=28&search_database=Search&search_db=Search&cpage=1&ecpage=1&ppage=1&spage=1&tpage=1&location=3&filter%5Bkeyword%5D=CSC+384#tt9374)

**Catalog Course Description:** Available at <http://catalog.umflint.edu>

###### Instructor Information

**Instructor:** Murali Mani, mmani@umich.edu

**Office Hours:** Office hours will be online, and I will use Google Meet (another video conference tool) for my office hours and for all meetings outside of lectures. The google meet link is: <https://meet.google.com/ibd-just-nxv>

Google Meet also has a call in feature. However, I believe it will be easier to use a video conference tool (for screen sharing etc). If you want to just call in using a phone, I will give details as needed.

Wednesdays: 09:30 – 10:30

Thursdays: 11:00 – 01:00

Or by appointment

*The instructor will try his best to answer questions at the earliest. The response can be expected within a few hours, however it can vary depending on the volume of questions, the instructor determining the best mode of responding to a student question (face to face, email, phone call, skype etc).*

*If you need further assistance, please visit the CIS/CSC Support Office in 212 MSB (open Monday-Friday, 8 am – 5 pm) or call the department office at (810) 762-3121*

###### Texts and Assigned Readings

**Texts (Recommended):**

1. A First Course in Database Systems (3rd Edition) by Ullman, Widom, Prentice Hall, 2008.

ISBN 978-0-13-600637-4 (a copy of this textbook will be kept in the reference section of the library)

There are several other excellent textbooks for introductory databases.

* Database Management Systems. Third Edition (information and additional resources available online at http://www.cs.wisc.edu/~dbbook/) by Raghu Ramakrishnan and Johannes Gehrke, McGraw-Hill
* *Database Systems: The Complete Book*, by Hector Garcia-Molina, Jeffrey D. Ullman, and Jennifer Widom, Prentice Hall (The recommended book is the first half of this complete book).
* *Fundamentals of Database Systems*, by Ramez Elmasri and Shamkant Navathe, Addison Wesley.
* *An Introduction to Database Systems*, by C. J. Date, Addison Wesley.

Several excellent textbooks are available in the library, many of them online. Two online books that I recommend (you may choose one depending on your individual style) are:

* *Oracle SQL by Example (4th Edition)* by Alice Rischert, Prentice Hall, 2009. Available at: <http://proquest.safaribooksonline.com/book/databases/oracle/9780137047345>
* *Head First SQL* by Lynn Beighley, OReilly, 2007, Available at: <http://proquest.safaribooksonline.com/book/databases/sql/9780596526849>

###### Course Details

**Course Overview**

This course introduces students to foundational aspects of database design, focusing on relational databases and SQL. The course will cover topics related to data modeling, including conceptual modeling techniques, designing relational databases, normalization, query formulation including relational algebra operators and SQL, and application development with relational databases. We will cover some advanced SQL concepts such as views, stored procedures and triggers. Quantitative examples and hands-on assignments will be given.

**Course Objectives**

1. Provide the student with a solid foundation of database systems, which could be useful in his/her professional career.
2. Provide the student with a thorough understanding of relational databases and SQL, as well as designing databases, and normalization.
3. Provide the student with an overview of some of the advanced concepts in SQL including views, stored procedures and triggers.
4. Provide the students experience with a commercial database software (Oracle).

**Student Learning Outcomes** (Based on Bloom’s taxonomy of cognitive domain as marked in parenthesis after each learning outcome)

1. The student will learn the basic mathematical concepts that are the foundations of databases, (knowledge)
2. The student will learn the design concepts in the ER (Entity Relationship) Model and develop the ability to transform application requirements into an ER schema, (knowledge, comprehension and synthesis)
3. The student will learn algorithms for translating ER schemas into relational schemas, and apply them to real world problems, (knowledge, comprehension and application)
4. The student will learn SQL DDL (Data Definition Language) and SQL DML (Data Manipulation Language), compute the results for a query, and determine what queries to write for real world problems (knowledge, comprehension and synthesis)
5. The student will use Oracle database software to develop applications, (application)
6. The student will develop an appreciation for different designs for an application, (analysis and evaluation)
7. The student will learn normalization concepts to remove redundancy in design and apply it to real-world problems, (knowledge, comprehension, analysis and application)

**Attaining the Course Objectives**

To pursue the course objectives effectively, students will engage in the following activities:

1. Read assigned material for each class session;
2. Participating in learning activities including flipped classroom sessions and clicker technology;
3. Complete individual homework assignments;
4. Complete project (group project recommended) in multiple phases;
5. Complete a midterm examination;
6. Complete a final examination.

Course Calendar/Schedule

#### ***Winter 2021 Jan 19, 2020 to Apr 20, 2020***

|  |  |  |  |
| --- | --- | --- | --- |
| # | Date | TOPIC/ACTIVITY | READING |
| 1 | Jan 20 – Jan 25 | Introduction, Oracle Setup | Chapter 1 |
| 2 | Jan 27 – Feb 08 | Conceptual Modeling: Entity Relationship Model | Chapter 4.1 – 4.4 |
| 3 | Feb 10 – Feb 17 | Relational Model and SQL DDL (Data Definition Language) | Chapter 2.1 – 2.3, 7.1.1 |
| 4 | Feb 12 | Translating E/R schema to Relational Schema | Chapter 4.5 – 4.6 |
| 5 | Feb 22 – Mar 08 | Relational Algebra Operators (An Overview) | Chapter 5.1 – 5.2  (An Overview) |
| 6 | Mar 03 | **MID-TERM (During Class Via Zoom)** |  |
| 7 | Mar 10 – Mar 31 | SQL DML | Chapter 6.1 – 6.5 |
| 8 | Apr 05 | SQL Views | Chapter 8.1 |
| 9 | Apr 07 | More SQL Constraints | Chapter 7.1 – 7.3 |
| 10 | Apr 12 – Apr 14 | Functional Dependencies and Normalization (An Overview) | Chapter 3.1 – 3.5 (An Overview) |
| 11 | Apr 19 | Stored Procedures, DB Application Development, Triggers (as time permits) | Chapter 9.1 – 9.4, 7.5 |
| 12 | Apr 28, 10:30 – 1:00 | **FINAL EXAM (Via Zoom)** | Comprehensive |

Summary of Grading Scheme

|  |  |
| --- | --- |
| Homeworks (score is for sincere effort – see below) | 15% |
| Project (groups recommended) | 25% |
| Mid-Term | 25% |
| Final Exam | 35% |

Homework and project assignment descriptions will be available from the course web site on bb. Students are expected to view/download the assignments. Failing to check the course web site is not an acceptable excuse for late submission, or missing exams.

**Homework Remarks:**

* Homework assignments are a critical part of learning. All students are encouraged to work on the homework questions diligently.
* You will be graded on your sincere effort for your homework. This consists of two aspects: (a) participation – any on-time submission of at least 75% of the homework even if it has errors is considered participation, and (b) demonstration – you must be able to explain the concepts behind the solution that you submitted (even if incorrect) to any homework problem. If you are not able to explain the concepts satisfactorily, then you could lose points for that homework.
* Although you are allowed and even encouraged to discuss the general concepts behind the home works with your classmates, you **MUST** complete them alone, and you **MUST** be able to individually demonstrate knowledge needed to solve similar problems.
* The instructor/grader will give feedback on the homework.
* Late homework submissions will not get points, and may not get feedback.
* No email submission of home works is accepted. Only submission via BB will be accepted.

**Project Remarks:**

* Project is also a critical part of learning. The project entails taking a real-world application and designing a database for it, including determining what queries are appropriate.
* You are encouraged to form groups with a maximum of four members (the recommended size for a group is 2 or 3). The scope of the project is such that a student by himself/herself can successfully complete the project. You must form your own groups. Talk to your peers (in class, using BB etc) to form groups.
* No inter-group discussion is permitted for any group assignment. Also remember, you **MUST NOT** do your homework in groups!!
* All the group members should have participated in each project phase equally, and all the members should be equally knowledgeable about each project phase.
* You will submit each project phase via BB. No late submissions will be allowed. Your submission (for all the Phases, from Phase 1 onwards) **MUST** include a report, which includes a description of what each group member contributed to the project phase.
* You **MUST** schedule a time slot (typically 15 minutes) with the instructor for demonstrating your group project, for each phase. All group members must be present during the demonstration, and answer questions. If a group member is not present, they will not receive credit for the project phase. If the entire group skips the demo, then no group member will receive credit.

The tentative schedule for project is as follows:

* Feb 08: Phase 0 is due. This assignment is to do with group formation. One member of the group will send an email to **the instructor and all the group members** with the group information. [Points: 4]
* Feb 22: Phase 1 is due. You will submit the report on BB, and schedule a demonstration slot where all group members will be present. [Points: 7. Graded for demonstration, report, and for answering questions]
* Mar 17: Phase 2 is due. You will submit the report on BB, and schedule a demonstration slot where all group members will be present. [Points: 7. Graded for demonstration, report, and for answering questions]
* Apr 19: Phase 3 is due. You will submit the report on BB, and schedule a demonstration slot where all group members will be present. [Points: 7. Graded for demonstration, report, and for answering questions]

**Meta-Cognition Remarks**

In order to facilitate learning, we would like you to assess your mastery of the different topics. We refer to your assessment of your own learning as meta-cognition. We will implement this as follows – for every homework assignment problem / exam question, we would like you to report on your confidence level in your answer/solution. We will collect this data and use as follows – determine which topics most of you are finding difficult and how to provide extra help. We will also use the data for academic research, as appropriate. There is no weightage for reporting this; however, we hope that all of you will report it, so that it helps us collectively.

**Grading Scale: (inclusive)**

|  |  |
| --- | --- |
| A+ | 97-100 |
| A | 92–96 |
| A- | 90–91 |
| B+ | 88–89 |
| B | 82–87 |
| B- | 80–81 |
| C+ | 78–79 |
| C | 72–77 |
| C- | 70–71 |
| D+ | 68–69 |
| D | 60–67 |
| E | 0–59 |

*Grading may be curved if the class performance warrants it. Curving can only improve grades from the grading scale above.*

###### Course Policy

**UM-Flint Suggested Syllabus Language related to Reopening**

[**Face Covering**](https://umflint.us17.list-manage.com/track/click?u=5e84763af1145bf849f410dd0&id=35567bacb6&e=7eb16d632c) **(**<https://drive.google.com/file/d/1QdEPu82AVINC1DVYXIJTgXcUYiwZzjQY/view>**)**   
*for the official face-covering policy that applies to this course. Students must abide by the face-covering policy that applies to the mode of delivery for this course.*

**Students Reporting Illness**(<https://drive.google.com/file/d/1-0DG2vL2_PJIpNTvGtFopYrF610LdjIS/view>)  
*Stay home if you are experiencing COVID-19 symptoms (fever or chills; cough; shortness of breath or difficulty breathing; fatigue; muscle or body aches; headache; new loss of taste or smell; sore throat, congestion or runny nose; nausea or vomiting; diarrhea) are asymptomatic but were exposed to someone who tested positive for COVID-19 (within 6’ for greater than 10 minutes) or tested positive for COVID-19. The University of Michigan-Flint is here to help. Please contact me via email and complete the* [Student Illness Reporting Form](https://umflint.us17.list-manage.com/track/click?u=5e84763af1145bf849f410dd0&id=4159532954&e=7eb16d632c) *located at* [*https://www.umflint.edu/covid-19*](https://www.umflint.edu/covid-19)*. A case manager will reach out to you to help provide support and resources.*

#### **General Policies:**

* Group project, midterm, final and most individual assignments must be completed to pass the course. On time delivery of complete documentation is expected. Specific criteria for the deliverables will be provided prior to the work assignments.
* The topics listed in the syllabus are only an estimate of the material, which can be covered during the semester. Some topics might be deleted and some others might be added at the discretion of the instructor.
* Teamwork and collegiality are encouraged but everyone must understand and be responsible for their work, actions and work products; observations of the Academic Integrity Policy are mandatory.
* All other University policies regarding incomplete grades, etc. apply.

**Academic Integrity** (<https://catalog.umflint.edu/content.php?catoid=29&navoid=3162>)

Intellectual integrity is the most fundamental value of an academic community. Students and faculty alike are expected to uphold the highest standards of honesty and integrity in their scholarship. No departure from the highest standards of intellectual integrity, whether by cheating, plagiarism, fabrication, falsification, or aiding and abetting dishonesty by another person, can be tolerated in a community of scholars. Such transgressions may result in action ranging from reduced grade or failure of a course, to expulsion from the University or revocation of degree.

It is the responsibility of all students and faculty to know the policies on academic integrity in the instructional units at the University of Michigan-Flint. Information about these policies and the appeals process is available from the appropriate administrative office of the instructional units: in the College of Arts and Sciences, the Office of the Dean of the College of Arts and Sciences; in the School of Education and Human Services, the Office of the Dean of the School of Education and Human Services; in the School of Management, the Office of the Dean of the School of Management; in the School of Health Professions and Studies, the Office of the Dean of the School of Health Professions and Studies and for graduate students, the Office of the Dean of Graduate Programs.

Departments and programs within these instructional units may have specific policies and procedures which further delineate academic integrity. In such cases students are bound by the University policy on academic integrity as well as these department or program policies.

**Procedural Rights of the Accused Student.** A student who is charged with academic dishonesty by an instructor, administrator, or another student may be assured that he/she has the right to a fair hearing of the charges and the evidence, the right to question witnesses, to invite witnesses on his/her behalf, and to introduce whatever other evidence may be relevant to the charge.

**Code of Academic Conduct.** The University, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. Therefore, an individual should realize that deception for the purpose of individual gain is an offense against the members of the community. Such dishonesty includes:

**Plagiarism:** taking credit for someone else’s work or ideas, submitting a piece of work (for example, an essay, research paper, assignment, laboratory report) which in part or in whole is not entirely the student’s own work without fully and accurately attributing those same portions to their correct source.

**Cheating:** using unauthorized notes, or study aids, or information from another student or student’s paper on an examination; altering a graded work after it has been returned, then submitting the work for regrading; allowing another person to do one’s work, then submitting the work under one’s own name.

**Fabrication:** fabricating data; selectively reporting or omitting conflicting data for deceptive purposes; presenting data in a piece of work when the data were not gathered in accordance with guidelines defining the appropriate methods of collecting or generating data; failing to include a substantially accurate account of the method by which the data were gathered or collected.

**Aiding and Abetting Dishonesty:** providing material or information to another person when it should reasonably be expected that such action could result in these materials or information being used in a manner that would violate this code of academic integrity.

**Falsification of Records and Official Documents:** altering documents affecting academic records; forging a signature of authorization or falsifying or omitting necessary information on an official academic document, election form, grade report, letter of permission, petition, or any document designed to meet or exempt a student from an established College or University academic regulation; falsification or unauthorized altering of information in any official academic computer file.

**Identity Theft:** Assuming another person’s identity or role through deception or without proper authorization. Communicating or acting under the guise, name, identification, email address, signature, or indicia of another person without proper authorization, or communicating under the rubric of an organization, entity, or unit that you do not have the authority to represent.

**Misrepresentation and Other Acts of Academic Dishonesty:** fraudulently obtaining and/or using academic materials that would give oneself an unfair advantage over other students or would deceive the person evaluating one’s academic performance.

**Attempts**. An attempt to commit an act prohibited by this code may be punished to the same extent as a completed violation.

**Classroom Etiquette:**

We understand that this class is held online synchronous. Therefore, different people have different constraints – like kids, pets, kids behaving as adults, adults behaving as kids ☺ etc. We would like to emphasize that the focus is on learning, and we want you to take ownership of your learning and to ensure that the learning of others is not impacted. The instructor may mute a student, if the instructors finds that a student is having technological glitches or other issues and that it is affecting learning.

Similarly, the instructor has kids, pets and kids behaving as pets. If any of that is affecting your learning, please bring it to the attention of the instructor so that we can address that.

The classroom lectures are videotaped and the links will be made available (you can download the videos, stream them etc). If you also want to record the lecture for whatever reason, please go ahead, as long as you are not affecting student learning for the entire class.

**Disability and Accessibilty Support Services (DASS):**

Section 504 of the Rehabilitation Act and the Americans with Disabilities Act require the University of Michigan-Flint to provide effective accommodations, auxiliary aids, and services for qualified students with documented disabilities. The purpose of these services is to provide equitable access to all aspects of the University's programs. Students with disabilities requiring accommodations to participate in class activities or meet course requirements should self-identify with Disability and Accessibility Support Services (DASS - <https://www.umflint.edu/disabilitysupportservices>) as early as possible at (810)762-3456 or [dassflint@umich.edu](mailto:dassflint@umich.edu). The office is located in 264 University Center. Students are expected to discuss course accommodations with their professors as early as possible.

**Available Support Services:**

There is a plethora of support services available to students from tutoring to mental health services. Many times students are unaware of the services available to them. One such service is tutoring:

<https://www.umflint.edu/studentsuccess/tutoring>

Another service available is the writing center. The Writing Center can help you with any writing or speaking project, from starting an assignment to the finished paper or speech. You can get help with papers or speeches for any course on campus, graduate or undergraduate.  Take a draft of your paper or speech to the Writing Center and the tutors will help you complete it. If you have an assignment sheet, bring that too.  For more information about the Writing Center or to schedule an appointment, go to the Writing Center website at <https://www.umflint.edu/writingcenter/writing-center-home>.

**Notes:**

The instructor reserves the right to modify course policies, the course calendar, assignment point values, and due dates. Any extenuating circumstances that hinder your participation in the course should be discussed with me as soon as those circumstances are known. Make-ups for graded activities may be arranged if an absence is caused by documented illness or personal emergency. A written explanation, including supporting documentation, must be submitted to me; if the explanation is acceptable, then an alternative to the graded activity will be arranged. Whenever possible, make-up arrangements must be completed prior to the scheduled activity.

Only properly documented reasons may be a valid cause to change the exam or other grading requirements of this course for possible make-up or some re-arrangements. Taking a vacation early is NOT a valid excuse to change any of the above.