TRINE
U N I V E R S I T Y

Course Syllabus

Course Title: Advanced Database

Term and Year:

Course and Section Number: INF 503

Time and Place: Online

Number of Credit Hours: 3

Instructor:

Office Location/Hours:

Office Hours:

Email:

Cell Phone:

Course Description: The course prepares students to manage advanced database applications. Students will explore high-level concepts and strategies for database administration to optimize business practices which include performance management, data integrity and disaster management. Students will conclude the course with a project developing a business database.

Learning Outcomes: Upon completion of this course, the student should be able to:

1. Evaluate strategic roles of data, databases, and database management in an organization.
2. Perform programming techniques that optimize database performance.
3. Develop a storage device, filing system, and indexing techniques that support data integrity.
4. Recommend programming techniques for securing databases against varying threats.
5. Prepare a database recovery plan utilizing disaster management strategies.

Prerequisites: Graduate student enrolled in the Information Studies Program.

Required Text: https://www.ucertify.com/cart/?order=02Crq&ref=&add_order=1

References: Fundamentals of Database Systems Course & Lab -uCertify. (2022). Retrieved 6 July 2022, from https://www.ucertify.com/p/fundamentals-of-database-systems.html

Other Materials:

Course Requirements:

Attendance/Participation: All students are expected to log in to their courses regularly throughout the week to receive instruction, materials, and updates from the instructor. It is your responsibility to check in and submit your assignments, complete your discussion board postings, and finish quizzes and exams by the due dates. If you do not participate in the course, you will be counted absent. Simply logging in is not enough; you must submit/complete an assignment, post to a discussion board, or other similar assignment tasks to avoid being counted absent. Instructors are required to submit attendance the Monday following each week of class. This attendance is reported to the Financial Aid Department and may result in the loss of any financial aid refund you

are expecting if you have not been participating in your courses. **In addition, you will be administratively dropped from the course if you are reported absent a total of three weeks.**

Preparation and participation are expected and are essential to a healthy learning environment. Reading assignments should be done prior to participating in the assignments and discussions. Discussions, reports, papers, and all other activities provide opportunities for you to apply course content to authentic situations, thus deepening the level at which you can understand and use what you are learning. Therefore, to succeed in this course, you should plan to participate to the best of your ability. Online learning requires a significant amount of self-discipline and sometimes creative scheduling. All students are expected to participate actively, showing evidence of logging into the course at least twice each week and actively engaging.

Grading/Evaluation:

Assignments	Points	Percentage
Pre-course & Post-course Assessment	100	10%
Study Cards	100	10%
Discussion	100	10%
Final Project	100	10%
Weekly Quizzes	200	20%
Lab Assignments	200	20%
Final Exam	200	20%
Total	**1000**	**100%**

Trine Graduate Grading Scale:

Grade	Percentage	Quality Points	Meaning of Grade
A	93-100	4.0	Excellent
B+	86-92	3.5	Very Good
B	81-85	3.0	Good
C+	75-80	2.5	Above Average
C	70-74	2.0	Average (lowest passing grade)
F	00-69	0.0	Failure
I	Incomplete	Not figured into GPA	
IP	In Progress (grade deferred)	Not figured into GPA	
W	Withdrawal	Withdrawal before completion of 80% of semester	
WP	Withdrawal	Withdrawal after completion of 80% of semester issued only under special circumstances and with approval of the department chair/director	

Other Policies:

Academic Misconduct:

The University prohibits all forms of academic misconduct. Academic misconduct refers to dishonesty in examinations (cheating), presenting the ideas or the writing of someone else as one's own (plagiarism) or knowingly furnishing false information to the University by forgery, alteration, or misuse of university documents, records, or identification. Academic dishonesty includes, but is not limited to, the following examples: permitting another student to plagiarize or cheat from one's own work, submitting an academic exercise (written work, printing, design, computer program) that has been prepared totally or in part by another, acquiring improper knowledge of the contents of an exam, using unauthorized material during an exam, submitting the same paper in two different courses without knowledge and consent of professors, or submitting a forged grade change slip or computer tampering. The faculty member has the authority to grant a failing grade in cases of academic misconduct as well as referring the case to Student Life.

Plagiarism:

You are expected to submit your own work and to identify any portion of work that has been borrowed from others in any form. An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and will result in an F for that assignment. A deliberate act of plagiarism, such as having someone else do your work, or submitting someone else's work as your own (e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), will at least result in an F for that assignment and could result in an F for the course.

Artificial Intelligence (AI) is prohibited: All work submitted by students in this course must be generated by the student. Students may not have another person or entity contribute to an assignment for them, which includes using AI. Students may not incorporate any part of an AI-generated response in an assignment, use AI to formulate arguments, use AI to generate ideas for an assignment, or submit work to an AI platform for improvement. Using an AI tool to generate content may qualify as academic misconduct in this course.

OR

Artificial Intelligence (AI) is allowed: Students may use AI tools on instructor-identified assignments in this course. To adhere to our scholarly values, students must cite any AI-generated material that informed their work. Using an AI tool without proper attribution may qualify as academic misconduct in this course. It is the responsibility of the student to verify the accuracy, reliability, and ethical implications of AI-generated content.

Electronic Devices:

Use of electronic devices including smart watches and cell phones is prohibited during exams or quizzes unless directly allowed by the instructor.

Statement on Learning:

Learning is a *shared responsibility*. As the instructor and as a student in this class, it is our shared responsibility to develop and maintain a positive learning environment for everyone. The instructor takes this responsibility very seriously and will inform members of the class if their behavior makes it difficult for him/her to carry out this task.

Students are asked to respect the learning needs of their classmates and assist the instructor in achieving this critical goal. It is the instructor's responsibility to present learning opportunities through the course syllabus, lectures, discussions, activities, in-class, and out-of-class assignments. It is the student's responsibility to do the learning by completing the readings, by attending class and by participating in class discussions and assignments. A variety of assignments will be used to determine how successful a student is at achieving the course learning

outcomes (mastery of course content and skills) outlined in the syllabus. If a student has trouble mastering the material and skills, he/she is encouraged to reflect on the strategies being used to study and prepare for each class. The instructor welcomes a dialogue on learning strategies and may be able to assist in finding resources on campus that will help improve student performance.

Additional Information: Additional Information for Online Courses:

A. Technology Tools:

1. Web Access: this course is taught in asynchronous mode, using Moodle and MindTap. Students will regular access to a web-accessible computer. Weekly participation is required.
2. Software: Microsoft Word, PowerPoint, and Adobe Reader.

B. Instructor Guidelines (Expectations):

1. The instructor reserves the right to require proctoring or validation of student's academic work at the instructor's discretion.
2. The instructor reserves the right to change or modify course materials or deadline in response to student feedback or unforeseen circumstances.
3. The instructor requests that students allow 24 hours to respond to student emails or other forms of contact.
4. The instructor will attempt to be available during weekdays; however, as balance between family and work is important in everyone's lives, the instructor reserves the right to be unavailable on weekends.
5. The instructor requests that the students allow the instructor one week from the date of submission, to post a grade, or provide feedback, on any assignment. (Note: the instructor will make every effort to provide faster turnaround time-however; sometimes faster turnaround time is not possible.)
6. The instructor may be "out-of-the-office" for extended periods of time, and requests that students understand this situation may occur and allow for such inconveniences. (However, instructor will always attempt to email and/or post an announcement to the class about any such inconveniences.)

C. Student Guidelines (Expectations):

1. Refer to the Assignment Schedule in Moodle for all due dates.
2. Late assignments will not be accepted.
3. Must know how to access their Moodle email account and will use this account for this course unless other arrangements have been made. Check your email periodically.
4. Keep a copy of all assignments until the end of the course. Check your Gradebook regularly for grades on assignments.
5. Review and refer to the syllabus, this Syllabus and the Course Announcements for all pertinent information.
6. Participate on a weekly basis in this course via Discussion Board (threaded discussion area) postings.
7. Log in on a regular access via internet accessible capabilities for this course.
8. Assume more responsibility (than in a regular face-to-face course) for his or her learning.
9. Understand that there are not any "lectures" in this course and students are responsible to read ALL course materials, including emails and announcements from the instructor.
10. There is a considerable amount of reading required for this course. Students should make sure to stay on target with reading assignments.

Office Hours:

Since this is an online class, please note I will not be available 24/7. As the instructor for this class, I am typically online in the morning and then periodically throughout the day. If you send an email, you can expect a reply in 24 hours or less. If I happen to miss an email from you, please choose a different method to reach me, such as calling/texting me at 248-687-9454. Leave a message with your name and the course information, so that I can quickly identify what to reference for your question.

Late Policies: This course covers a lot of material and late assignments will seriously impact your ability to learn the next section of the course. Assignments are due at 11:59pm (EST) the due date. Late submission will be penalized 10% per day, up to 4 days. After that the assignments will not be accepted (no exceptions). Please try to start earlier and finish your assignments on time.

TRINEONLINE

Course Mapping

INF 503 Advanced Database

Course Description: The course prepares students to manage advanced database applications. Students will explore high-level concepts and strategies for database administration to optimize business practices which include performance management, data integrity and disaster management. Students will conclude the course with a project developing a business database.

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Week One: LO1,3	
Learning Activities and Materials	**Assessments**
Read: 1- Lesson 1: Databases and Database Users. (LO 1) 2- Lesson 2: Database System Concepts and Architecture (LO 1) Lesson 3: Data Modeling Using the Entity–Relationship (ER) Model (LO 3)	**Discussion Forum 1:** 1. Introduce yourself to the class and describe what is a database. 2. Discuss the main characteristics of the database approach and how it differs from traditional file systems. Discuss the differences between database systems and information retrieval. A minimum of 1 outside reference is required along with APA formatting. (LO1) (LO3) **Assessment:** 3. Lesson 1-3 Study Card (LO 1) (LO 3) 4. Lesson 1-3 Quiz (LO 1) (LO3) 5. Lesson 3 Lab: Understanding Physical Schema - ER Model (LO 3) 6. Complete Pre-assessment (LO 1-LO 5)
Week Two: LO1,3	
Learning Activities and Materials	**Assessments**

Read:	
1. Lesson 4: The Enhanced Entity–Relationship (EER) Model (LO 3) 2. Lesson 5: The Relational Data Model and Relational Database Constraints. (LO1) Lesson 6: SQL Data Definition and Data Types (LO3)	

Week Three: LO1,3

Learning Activities and Materials	Assessments
Read: 1. Lesson 7: More SQL: Complex Queries, Triggers, Views, and Schema Modification (LO 3) 2. Lesson 8: The Relational Algebra and Relational Calculus (LO3) Lesson 9: Relational Database Design by ER- and EER-to-Relational Mapping (LO1)	**Assessment:** 1. Lesson 7-9 Study Card (LO1) (LO3) 2. Lesson 7-9 Quiz (LO1) (LO3) 3. Lesson 7 Labs: 7.1.1 Retrieving values of a table using nested queries- 7.4.1 Modifying the table definition. (LO1) (LO3) 4. Lesson 8 Labs: 8.1.1 Retrieving the distinct rows from the table- 8.2.1: Understanding relational set operator (LO1) (LO3)

Week Four: LO2

Learning Activities and Materials	Assessments
Read: 1- Lesson 10: Introduction to SQL Programming Techniques (LO2) 2- Lesson 11: Web Database Programming Using PHP (LO2) Lesson 12: Object and Object-Relational Databases (LO2)	**Discussion Forum 3:** 1. What is ODBC? How is it related to SQL/CLI? List the three main approaches to database programming. What are the advantages and disadvantages of each approach? A minimum of 1 outside reference is required along with APA formatting. (LO2) **Assessment:** 1. Lesson 10-12 Study Card (LO2) 2. Lesson 10-12 Quiz (LO2) 3. Lesson 12 Lab: Drag the object database concept to its description (LO 2)

Week Five: LO1,3

Learning Activities and Materials	Assessments

Read:
   1. Lesson 14: Basics of Functional Dependencies and Normalization for Relational Databases (LO 1)
   2. Lesson 16: Disk Storage, Basic File Structures, Hashing, and Modern Storage Architectures. (LO 3)
Lesson 17: Indexing Structures for Files and Physical Database Design (LO 3)
	Discussion Forum 4:
	
	1- What is the difference between primary and secondary storage? Discuss the mechanism used to read data from or write data to the disk. What is the difference between static and dynamic files? A minimum of 1 outside reference is required along with APA formatting. (LO1) (LO3)
	
	Assessment:
	
	   2- Lesson 14,16, and 17 Study Card (LO1) (LO3)
	   3- Lesson 14,16, and 17 Quiz (LO1) (LO3)
	Lesson 14,16, and 17 Lab: (LO1) (LO3)

Week Six: LO1,3

Learning Activities and Materials	Assessments

Read:
   1. Lesson 18: Strategies for Query Processing (LO 3)
   2. Lesson 20: Introduction to Transaction Processing Concepts and Theory (LO 1)
   3. Lesson 21: Concurrency Control Techniques (LO 1)
	Assessment:
	
	   1- Lesson 18,20, and 21 Study Card (LO1) (LO3)
	   2- Lesson 18,20, and 21 Quiz (LO1) (LO3)
	   3- Lesson 18,20, and 21 Lab: (LO1) (LO3)

Week Seven: LO5

Learning Activities and Materials	Assessments

Read:
   1. Lesson 22: Database Recovery Techniques (LO 5)
   2. Lesson 23: Distributed Database Concepts (LO 5)
	Assessment:
	
	   1- Lesson 22, and 23 Study Card (LO5)
	   2- Lesson 22, and 23 Quiz (LO5)
	   3- Lesson 22, and 23 Labs
	Complete final Project- develop a business database (LO5)

Week Eight: LO4

Learning Activities and Materials	Assessments

Read:
   1. Lesson 30: Database Security (LO 4)
	Assessment:
	   1. Lesson 30 Study Card (LO4)
	   2. Lesson 30 Quiz (LO4)
	   3. Lesson 30 Lab: Identifying database attacks (LO4)
	   4. Complete post assessment (LO1- LO 5)
	   5. Complete Final Exam (LO1- LO 5)