CSCI 2020 – DATABASE FUNDAMENTALS

Course Details:
Spring 2025 January 21st – May 8th 2025
Tuesday & Thursday 10:00 AM – 11:30 AM

Instructor Information:
Benjamin Burton
Email: burtonbr@etsu.edu

Prerequisites: None
Corequisites: None
Credit: 3 credit hours

Office Hours (2.2I11):
Monday | Wednesday: 5:00 PM – 7:00 PM
Tuesday | Thursday: 11:30 AM – 12:00 PM

COURSE DESCRIPTION AND MAJOR TOPICS:

This course introduces essential skills of creating, maintaining, and querying a database system. Basic methodologies for transferring data between a database and a program or web page will be covered. Also considered will be methodologies for database design to ensure consistency and accuracy of the data.

Major Topics
- Data and DBMS
- Concepts of relational database models
- Entity-Relationship Diagram
- Normalization of databases
- Primary and Foreign Keys
- Indexes and constraints
- Data Definition Language (DDL)
- Data Manipulation Language (DML)
- Data Control Language (DCL)
- Stored Programs
- Connecting to a DB from a programming language
- Database Transactions: ACID properties
- Locking Mechanisms
- Deadlocks

Course Goals

Students should be able to understand relational database concepts and apply them in the design and implementation of new relational databases. Students should be able to retrieve and process data from existing relational databases using SQL.

COURSE LEARNING OUTCOMES:

At the end of this course, students who earn a passing grade shall be able to:

- Build a simple 3-5 table database
- Analyze the benefits of different database designs
- Identify and use primary and foreign keys
- Construct SQL queries that: join 2 or more tables, utilize aggregate functions, and sort their output
- Develop programs that move information between programs and a database in both directions
- Employ basic SQL security features

Course Materials

- All course materials, readings, and resources will be provided online through D2L (http://elearn.etsu.edu)
- Students should regularly check D2L for announcements, assignments, and course updates

Required Software

Students need consistent and reliable access to a computer with the following software installed:

1. **Database Management Software:**
   a. Microsoft SQL Server Management Studio
2. **Diagramming Tools:**
   a. Mermaid (for creating diagrams and flowcharts)
   b. Astah (https://astah.net)
   c. diagrams.net (https://www.diagrams.net/)
   d. DataGrip (https://www.jetbrains.com/datagrip/download/#section=windows)
3. **Learning Management System:**
   a. D2L (http://elearn.etsu.edu)

Note: Your computer should meet the minimum specifications according to the software vendor sites. The software must be compatible with either Linux, Mac, or Windows operating systems.

GRADE DISTRIBUTION

Final Grade:

GRADED ITEM	WEIGHT
JEDI TRANING MISSIONS	25%
GALACTIC DATABASE INITATIVE	35%
HOLOCRON KNOWLEDGE TEST	15%
PADAWAN TRIALS (MIDTERM)	5%
THE TRIALS OF MASTERY (FINAL)	15%
JEDI COUNNCIL CONTRIBUTIONS	5%
TOTAL	100%

A student can keep track of their grades throughout the semester using D2L. Students should calculate the grade according to the "Grade Distribution" information provided for the course.

GRADING SCALE:

*Percentage	Letter	*Percentage	Letter
93.000 – 100.00	A	77.000 – 79.999	C+
90.000 – 92.999	A-	73.000 – 76.999	C
87.000 – 89.999	B+	70.000 – 72.999	C-
83.000 – 86.999	B	60.000 – 69.999	D
80.000 – 82.999	B-	0 – 59.999	F

Note: *Final Grades **will not observe** traditional rounding rules. (i.e., 89.999 will result in a B+)

COURSE ASSESSMENTS AND GRADING

Throughout your journey to becoming a Database Knight, you'll face various challenges and opportunities to prove your mastery of the data arts. Here's how your training will be evaluated:

Jedi Training Missions (Weekly Labs) - 25% Hands-on weekly lab assignments that focus on practical database skills and implementation. Each lab aligns with that week's module content and requires individual work. You'll practice creating databases, writing SQL queries, implementing security features, and solving real-world database challenges. While themed as "training missions," these labs will focus on practical business and organizational scenarios that prepare you for industry applications.

Galactic Database Initiative (Semester Project) - 35% A comprehensive group database project where teams of 3-4 students will design and implement a complete database solution for a real-world business case. Groups will progress through all phases of database development including a final presentation.

Holocron Knowledge Tests (Module Quizzes) - 15% Regular assessments testing your understanding of database concepts and practical skills. Each quiz covers material from the corresponding module and includes:

- Multiple choice questions on database theory
- Short answer conceptual questions
- Hands-on SQL query challenges
- Database design problems Quizzes ensure you're mastering fundamental concepts before moving to more advanced topics.

Padawan Trials (Midterm Exam) - 5% A comprehensive midterm examination covering the first half of the course material and the exam includes both written and practical components.

The Trials of Mastery (Final Exam) - 15% The final comprehensive examination covering all course concepts and the exam includes both written and practical components.

Jedi Council Contributions (Participation) - 5% Active engagement in the learning process through:

- Regular class attendance
- Participation in discussions and Q&A sessions
- Engagement in peer review activities
- Contribution to group work and class exercises
- Professional conduct and collaboration

ATTENDANCE POLICY

Attendance is mandatory for all class meetings. Some course materials and assignments may be made accessible online, allowing you to complete them on your schedule, if you adhere to the expected deadlines and due dates. The primary method of instruction will involve weekly class meetings, during which the instructor will deliver instruction in real-time in the classroom.

Please be aware that missing class or arriving late, regardless of the reason, can significantly impact your learning experience and may adversely affect your achievement in the course. Absence from class may result in receiving a zero on the class content covered during that session, including assignments, quizzes, or discussions.

If you must miss class, it is your responsibility to obtain missed information from your classmates. Please note that missing class does not extend deadlines or allow for makeup assignments, except in exceptional circumstances as determined by the instructor.

If you face extenuating circumstances that may affect your attendance, such as a severe illness or family emergency, please communicate with me as soon as possible to discuss potential accommodation. However, such accommodation will be made at the instructor's discretion and may require appropriate documentation.

Please note that this class also follows the BlueSky Tennessee Institute Student handbook attendance policy found in the BlueSky Student Resources: BlueSky Tennessee Institute (etsu.edu)

LATE WORK POLICY

Please be aware that late work will not be accepted without proper documentation justifying a university-approved absence. It is the student's responsibility to submit assignments, projects, and other coursework by specified deadlines.

In the event of a university-approved absence, such as a serious illness, family emergency, or participation in university-sponsored events, students must provide the instructor with appropriate documentation explaining the circumstances. This documentation should be submitted to the instructor as soon as possible, preferably before the absence occurs or immediately upon returning to class.

If you anticipate any issues with meeting deadlines or have concerns about potential absences, please communicate with the instructor proactively to discuss your situation and explore possible solutions.

More information can be found here: Attendance Policy (etsu.edu)

STAYING ENGAGED AND INFORMED

To ensure your success with this course, it is essential to stay engaged and informed beyond attending class meetings. Here are a few suggestions for success in this course:

EMAIL COMMUNICATION:

- You should only use email as a tool to contact the instructor if necessary. If you have a complex question or a question related to the course, it is better to schedule a meeting rather than await an email response. Start on assignments early, so you have ample time to finish and ask questions.
- Check your email frequently and regularly to stay current with university-related communications and communications regarding this course.
- Respond promptly to any emails from the instructor or your classmates that require your attention or action.
- All email subjects must be in the format of **CSCI {Course #} - {Subject Matter}**. (E.g., CSCI 1900-800 Huffman Code Question) Following the format will ensure an email is appropriately delivered and notify the instructor. You are not guaranteed a response should you fail to adhere to this subject line format.
- I strive to respond to emails within 24-48 hours during the regular business week (Monday through Friday) between 9 am and 5 pm. If you send an email over the weekend, you can generally expect a response on the following business day.

D2L (DESIRE2LEARN)

- Access the D2L platform daily to keep current with any changes or new information regarding this course.
- Regularly review course materials, announcements, and updates posted on D2L.
- Utilize D2L to submit assignments, participate in discussions, and access additional resources provided by the instructor.

STUDENT AND INSTRUCTOR EXPECTATIONS

To foster a productive and engaging learning environment, students and instructors should have mutual expectations of one another. Remember, mutual respect and open communication between students and instructors are essential for creating a positive and effective learning experience.

STUDENT RESPONSIBILITIES:

- Arrive to class on time and well-prepared.
- Be attentive and actively participate in class discussions and activities.
- Complete assignments by their due dates.
- Strive to meet the course objectives.
- Devote ample time and effort to the course (a minimum of 2-3 hours outside of class for each hour in class).
- Ask relevant questions and contribute to class discussions to enhance learning for all.
- Take comprehensive notes during class to support the learning process.
- Respect classmates and instructors, maintaining a distraction-free learning environment.
- Engage in professional communication with classmates and faculty, building good habits for future careers.

INSTRUCTOR COMMITMENTS:

- Maximize every student's learning potential.
- Be prepared, organized, and respectful toward each student.
- Arrive to class on time and well-prepared.
- Be attentive to student's needs and available to answer questions.
- Provide assistance related to the course and help students achieve course objectives.
- Make suitable arrangements for class continuity in the rare event of the instructor's absence.
- Devote significant time and effort to the course.

PERSONAL TECHNOLOGY USE POLICY

To maintain a focused and productive learning environment, students must silence all electronic devices, including mobile phones, iPads, laptops, and tablets, during classroom and lab lectures. While the use of laptops or tablets is permitted in class, they should be used solely for activities that contribute to the classroom learning experience, such as taking notes or accessing course-related materials.

If a student is found using electronic devices for purposes unrelated to the classroom learning environment, the instructor reserves the right to ask the student to leave the classroom. This policy ensures that all students can engage fully in the course content without distractions.

EXAM POLICY

During exams, ALL electronic devices must be turned off and put away, including cell phones. If you have an emergent need that requires the use of an electronic device, please schedule that need outside of the exam time to avoid any disruptions.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Students with disabilities who require the use of electronic devices during exams should register through the university's disability services office. Once registered, students must provide the instructor with the appropriate accommodation form to ensure that their needs are met while maintaining the integrity of the exam environment.

ACADEMIC INTEGRITY & CODE OF CONDUCT POLICIES

Without exception, all submitted work for this class is to be done on an individual basis. Student-teacher relationships are built on trust. For example, students must trust that teachers have made responsible decisions about the structure and content of the course, and teachers must trust that work submitted by a student was indeed done by the student. Acts that violate this trust undermine the educational process and are inconsistent with our very reason for being at ETSU.

You are encouraged to discuss the material and issues addressed in the course with members of the class and others. Helping one another understand the process for problem-solving is permitted as long as submitted work is done as an individual attempt. Everyone must do his/her work. Completing an assignment "by committee" and submitting it as individual work is academic misconduct unless the assignment has been designated as a team assignment. Your name on the submitted work is an affirmation that the work is yours.

HONOR CODE

East Tennessee State University is committed to developing the intellect and ethical behavior of its students. Students who violate policies on plagiarism, cheating, or fabrication will be held accountable for their actions. Students should report any knowledge of academic misconduct. Students are expected to act with honesty, integrity, and civility in all matters.

HONOR PLEDGE (PLEDGED AT UNIVERSITY ORIENTATION)

By becoming a member of the campus community, students agree to live by the standards of the honor code and thereby pledge the following: "I pledge to act with honesty, integrity, and civility in all matters."

PLAGIARISM

Plagiarism involves using someone else's words, ideas, and code without crediting the original author. Even if one does not copy the words exactly or even copies only a tiny part of someone else's work, one must cite the original author's name and provide a reference to that person's work (e.g., the title of work, year of publication, and name of publisher).

ARTIFICIAL INTELLIGENCE STATEMENT

You are welcome to use generative artificial intelligence (AI) tools (such as ChatGPT) in this class as doing so aligns with our course learning goals. However, you must properly cite any AI tools that you use in your work and be responsible for the accuracy and quality of the content generated by them.

Please note that this policy is a general-use policy on Artificial Intelligence. Your instructor reserves the right to change this policy based on individual circumstances and assignments. The use of Artificial Intelligence is strictly prohibited on examinations and falls under the university's academic misconduct policy.

REPEATING A COURSE AND COURSEWORK RESUBMISSION

When students must repeat a course, they may not resubmit work submitted in a prior class instance. In the case of research papers or other class items, students must select a different topic, and the work on the project must be wholly different from the work previously submitted. For other course assignments, the student must submit original work. Students may not submit work from other classes.

VIOLATION OF THE HONOR CODE

In cases where the honor code or other topics in the academic integrity section are violated, known as academic misconduct, the penalty will be an 'F' in the course. Be aware that repeated academic misconduct may result in the University applying other penalties.

STUDENT SERVICES RESOURCES

STUDENT SERVICES

The ETSU Services webpage includes a comprehensive list of services available to all ETSU students.

ACADEMIC ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

It is the policy of ETSU to accommodate students with disabilities according to federal law, state law, and the University's commitment to equal educational access. Any student with a disability who needs accommodation, for example, arrangement for examinations or seating placement, should inform the instructor at the beginning of the course. ETSU provides Faculty accommodation forms to students through Disability Services in the D.P. Culp Center, Room 326, telephone 423-439-8346. Visit the Disability Services webpage for more information.

MENTAL HEALTH SERVICES

The BucsCARE website is meant to be a resource for students and student referrals. BucsCARE includes the most referenced offices and campus resources in various categories. This page includes a link to ETSU's "Need Help?" site, including a comprehensive listing of other resources by topic area.

Learn more about the BucsCARE services at: https://www.etsu.edu/bucscare/default.php

LIBRARY RESOURCES

The Sherrod Library extends access and services to all currently enrolled ETSU students. These services include traditional library patronage via Research and Instructional Services, Technology, and Content Services. Learn more about the Sherrod Library by visiting https://libraries.etsu.edu

TECHNICAL RESOURCES

HELP DESK

The Information Technology Services (ITS) Help Desk is the best resource for most technical problems. Find answers to common questions on the Help Desk website, call, email, or stop in to see them on the first floor of the Sherrod Library. Phone: 423-439-4648 Email: itshelp@etsu.edu

DESIRE2LEARN (D2L) ONLINE HELP

Faculty, Staff, and Students can find answers to D2L-related questions on the D2L Help Student Home. If you still have trouble finding what you need, contact the Help Desk.

MICROSOFT OFFICE SOFTWARE

Microsoft Office productivity applications, including Word, PowerPoint, Excel, OneNote, and more, are free for students through the University's Office 365 campus agreement. For instructions on obtaining the software, see the Office 365 page of the ITS Help Desk website.

TURNITIN PLAGIARISM DETECTION

Turnitin is a plagiarism detection service available to students and faculty at ETSU. This tool compares student-written work against a comprehensive database of other work and various internet sources. Faculty may employ this service for some or all written assignments to help students learn to cite sources accurately and ensure academic integrity. Learn more on the [Turnitin home page](#).

ETSU TECHNICAL RESOURCES

Faculty, Staff, and Students can find many other technical resources on the [Online Help webpage](#).

SYLLABUS ATTACHMENT

Students can find information regarding other University policies, procedures, and resources here:
https://www.etsu.edu/curriculum-innovation/syllabusattachment.php

BLUESKY STUDENT HANDBOOK ATTACHMENT

BlueSky students can find information regarding other BlueSky policies, procedures, and resources here:
https://www.etsu.edu/cbat/computing/bluesky-tn-institute.php

DISCLAIMERS

SYLLABUS CHANGES

The instructor reserves the right to change the syllabus including grade distribution. The instructor will immediately notify students of such changes by posting the notification and the nature of the change(s) on the course site.

SCHEDULE CHANGES

The instructor reserves the right to change the course schedule. The instructor will immediately notify students of such changes by posting the notification and the nature of the change(s) on the course site.

COURSE THEME DISCLAIMER

This course utilizes themes and terminology from the Star Wars universe as an engaging framework for learning database concepts. The Star Wars references, including terms like "Jedi," "Padawan," "Holocron," and related concepts, are used under fair use for educational purposes. This course and its materials are designed for educational use only within the classroom setting.

The use of Star Wars themes is intended to create an engaging learning environment and provide memorable context for complex database concepts. While assignments and assessments may use Star Wars-themed names, the actual content focuses on real-world database applications and industry-standard practices.

All Star Wars-related content, names, and terminology are property of Lucasfilm Ltd. LLC and The Walt Disney Company. This course is not affiliated with, sponsored, or endorsed by Lucasfilm Ltd. LLC, The Walt Disney Company, or any Star Wars license holders.