Tompkins Cortland Community College

Master Course Syllabus

Course Discipline and Number: CIS 220 **Year: 2024-2025**

Course Title: Database Concepts **Credit Hours: 3**

I. Course Description: This course covers design and implementation of databases using common DBMS packages. The role of databases in business is discussed, with an emphasis on databases in microcomputers, database design, including definition of requirements, data modeling, normalization techniques, implementation, and Structured Query Language (SQL). Prerequisites: CIS 108 or CSCI 160; prior completion of, or concurrent enrollment in, ENGL 100 or ESL 120, 121, and 122 if required by placement. 3 Cr. (3 Lec.) Fall semester.

II. Additional Course Information:

1. CIS 220 is required for degree completion in the Computer Science A. S., Computer Information Systems A.A.S and Computer Support Specialist, A.A.S.
2. Students must have access to a computer with Windows, Mac OSX, or Linux installed. ChromeBooks and iPads are not appropriate for this course.
3. All software and tools used in the course are free and platform independent. Students will need to be able to install and configure software.
4. This course is offered in the Fall semester only, both in-person and remote asynchronous.

III. Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Explain the role of databases in modern society
2. Analyze case studies and perform needs assessment of common business models
3. Apply concepts of normalization by creating a database as a result of needs assessment
4. Design Structured Query Language (SQL) statements to create, manipulate and query database tables
5. Work on a shared goal in a group setting

IV. Tompkins Cortland Institutional Learning Outcomes; Program Learning Outcomes; SUNY General Education Competencies and Knowledge and Skills Areas

Tompkins Cortland ILOs N/A

Complete this section for “service” courses only (e.g. courses that are required of all students; courses that are not program specific but satisfy liberal arts requirements; or commonly used in multiple academic programs to meet non-program-specific requirements). Check only Institutional Learning Outcomes (ILOs) that are meaningfully developed and assessed in this course. For each ILO chosen, include the SLO to which it aligns.

Students will:

☐ Communicate effectively, in oral and written forms, taking into consideration audience and purpose.

☐ Apply principles and methods of scientific inquiry and quantitative reasoning appropriate to their discipline.

☐ Use information, critical thinking, and the creative process to solve problems and reach conclusions.

☐ Use technology appropriate to their discipline.

☐ Describe the ways in which social, economic, or environmental sustainability depends on their own and the collective contributions of a diversity of ideas and people.

Program Learning Outcomes

Complete this section for program-specific courses (e.g. those that share the same 4 letter designation as the academic program or satisfy requirements in related programs). List the academic program(s) here and note which Student Learning Outcomes align to specific Programmatic Learning Outcomes. Please see the MCS Instructions for more details.

Specify the Academic Program

- **Computer Science General and Engineering Sequences (CS)**
- **Computer Information Systems (CIS)**
- **Computer Support Specialist (CSS)**

1. **CIS PLO:** Apply concepts of programming, data storage and networking to creative solutions for business projects and organizational challenges.
    1. **SLO:** Apply concepts of normalization by creating a database as a result of needs assessment

2. **CSS PLO:** Apply concepts of programming, data storage, networking and hardware/software support to creative solutions for business projects and organizational challenges.
    1. **SLO:** Apply concepts of normalization by creating a database as a result of needs assessment

3. **CS PLO:** Apply various programming languages, design patterns and storage techniques to creative solutions for common problems.
    1. **SLO:** Apply concepts of normalization by creating a database as a result of needs assessment

4. **CSS PLO:** Participate in team/group work, applying concepts to real world projects based on business scenarios.
    1. **SLO:** Work on a shared goal in a group setting

5. **CIS PLO:** Participate in team/group work, applying concepts to real world projects based on business scenarios
    1. **SLO:** Work on a shared goal in a group setting

SUNY General Education Competencies – N/A

If this course assesses a SUNY GEN ED Competency, check all that apply and indicate which course outcome(s) address each checked item:

☐ CRITICAL THINKING & REASONING- Students will:

a. clearly articulate an issue or problem;
b. identify, analyze, and evaluate ideas, data, and arguments as they occur in their own or others' work; acknowledge limitations such as perspective and bias; and
c. develop well-reasoned (logical) arguments to form judgments and/or draw conclusions.

☐ INFORMATION LITERACY - Students will:

a. locate information effectively using tools appropriate to their need and discipline; evaluate information with an awareness of authority, validity, and bias; and demonstrate an understanding of the ethical dimensions of information use, creation, and dissemination.

☐ SUNY GENERAL EDUCATION KNOWLEDGE AND SKILLS AREA(s): N/A
For courses that are approved to meet one (or more) of the ten SUNY General Education Knowledge and Skills Areas, indicate which area the course fulfills, and which outcome(s) are aligned with the SUNY outcomes for that area:

☐ This course does not address any of the above Tompkins Cortland ILOs, PLOs, or SUNY General Education Competencies or Knowledge and Skills Areas.

V. Essential Topics/Themes

1. Common database models used in industry with a focus on the relational model
2. Use the Unified Modeling Language to create database diagrams
3. Analyze case studies of common business models and scenarios to conduct needs assessment
4. Using a common database management system, implement a design from a UML diagram
5. Apply the normalization process to a given set of relational database tables.
6. Create a database, build and populate tables using the Structured Query Language
7. Insert new data and manipulate existing data using the Structured Query Language
8. Extract data and compile information using the Structured Query Language
9. Communicate with a database using a common programming language such as Python
10. Complete a semester-long group project

VI. Methods of Assessment/Evaluation

Method	% Course Grade
1. Assignments or quizzes based on readings	5 – 15%
2. Individual Assignments and Discussion	15 – 30%
3. Group Project	15 – 40%
4. Exams	15 – 40%

VII. Texts – ☐ Required ☒ Recommended ☐ Used for more than one course (list courses)

	OER
1. *A Practical Introduction to Databases*: Christopher Painter. https://runestone.academy	☒
2. *Database Design* - 2nd Edition: Adrienne Watt. https://opentextbc.ca/dbdesign01	☒

Editions listed are current as of date of syllabus. More recent editions may be used.

VIII. Bibliography of Supplemental Materials

1. Database and SQL articles: https://www.guru99.com/introduction-to-database-sql.html
2. SQL Tutorial: https://www.sqltutorial.org/
3. SQL Reference: https://www.tutorialrepublic.com/sql-tutorial

Editions listed are current as of date of syllabus. More recent editions may be used.

IX. Other Learning Resources

Audiovisual: Hundreds of hours of YouTube tutorials on Database Design and SQL: https://www.youtube.com/results?search_query=database+and+sql

Electronic:
Popular Database Management System: https://www.mysql.com/
Graphical User Interface for MySQL: https://www.mysql.com/products/workbench/
Free UML Diagramming tool: https://app.diagrams.net/

Other: None specified

Attendance Policy: *To maintain good grades, regular attendance in class is necessary. Absence from class is considered a serious matter and absence never excuses a student from class work. It is the responsibility of all instructors to distribute reasonable attendance policies in writing during the first week of class. Students are required to comply with the attendance policy set by each of their instructors. Students are not penalized if they are unable to attend classes or participate in exams on particular days because of religious beliefs, in accordance with Chapter 161, Section 224-a of the Education Law of the State of New York. Students who plan to be absent from classroom activity for religious reasons should discuss the absence in advance with their instructors. See college catalog for more information.*

Services for Students with Disabilities: *It is the College's policy to provide, on an individual basis, appropriate academic adjustments for students with disabilities, which may affect their ability to fully participate in program or course activities or to meet course requirements. Students with disabilities should contact the Coordinator of Access and Equity Services, to discuss their particular need for academic adjustments. All course materials are available in alternate formats upon request.*

Academic Integrity: *Every student at Tompkins Cortland Community College is expected to act in an academically honest fashion in all aspects of his or her academic work: in writing papers and reports, in taking examinations, in performing laboratory experiments and reporting the results, in clinical and cooperative learning experiences, and in attending to paperwork such as registration forms.*
Any written work submitted by a student must be his or her own. If the student uses the words or ideas of someone else, he or she must cite the source by such means as a footnote. Our guiding principle is that any honest evaluation of a student's performance must be based on that student's work. Any action taken by a student that would result in misrepresentation of someone else's work or actions as the student's own — such as cheating on a test, submitting for credit a paper written by another person, or forging an advisor's signature — is intellectually dishonest and deserving of censure.
Several degree programs offer student learning opportunities (such as internships, field work, and clinical experiences) outside the standard classroom setting. As part of the learning process, students must understand and engage in conduct that adheres to principles guiding employment within the professional workplace. These behaviors include, but are not limited to, academic integrity, accountability, reliability, respect, use of appropriate language and dress, civility, professional ethics, honesty, and trustworthiness. Disciplinary action may be initiated for inappropriate conduct occurring while participating in any course-related project or event.