

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Discrete Structures II
COURSE NUMBER	CIST-0291
DIVISION	Career and Technical Education
DEPARTMENT	CIST
CIP CODE	11.0801
CREDIT HOURS	3
CONTACT HOURS/WEEK	Class: 3 Lab: 0
PREREQUISITES	CIST-0191: Discrete Structures I
COREQUISITES	None

COURSE DESCRIPTION

By the end of this course, the student should be able to understand the fundamentals of discrete mathematics and its relation to computer systems and computer applications. The student will experiment with a variety of fundamental mathematical principles including but not limited to: fundamental mathematical principles, combinatorial analysis, mathematical reasoning, graphs and trees, and Boolean logic circuits.

PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:
https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. Develop Applications: Develop a list processing software application.

INSTITUTIONAL LEARNING OUTCOMES

- Communication
- Computation and Financial Literacy
- Critical Reasoning
- Technology and Information Literacy
- Community and Civic Responsibility
- Personal and Interpersonal Skills

TEXTBOOKS

<http://kckccbookstore.com/>

METHOD OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

- I. Microsoft Windows 8
 - A. Introduction to Windows 8.
- II. Microsoft PowerPoint 2013
 - A. Creating and editing a basic presentation.
 - B. Enhancing a presentation with pictures and shapes.
 - C. Reusing a presentation and adding multimedia.
- III. Microsoft Word 2013
 - A. Creating, formatting, and editing a word document with a picture.
 - B. Creating a research paper with citations and references.
 - C. Creating a business letter with a letterhead and table.
- IV. Microsoft Excel 2013
 - A. Creating a worksheet and an embedded chart.
 - B. Formulas, functions, and formatting.
 - C. What-If analysis and working with large worksheets.
- V. Microsoft Access 2013
 - A. Creating and using a database.
 - B. Querying a database.
 - C. Maintaining a database.
- VI. Microsoft Excel 2013
 - A. Creating a worksheet and an embedded chart.
 - B. Formulas, functions, and formatting.
 - C. What-If analysis and working with large worksheets.
- VII. Microsoft Access 2013
 - A. Creating and using a database.
 - B. Querying a database.
 - C. Maintaining a database.
- VIII. Microsoft Excel 2013
 - A. Creating a worksheet and an embedded chart.
 - B. Formulas, functions, and formatting.
 - C. What-If analysis and working with large worksheets.

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon completion of the course, the student will:

- A. Use the fundamental mathematical tools and techniques needed for most courses in computer science.
 - 1. Develop the ability to reason precisely using discrete mathematics models.
 - 2. Apply the relationship between discrete mathematics and computer science.
 - 3. Apply the elements of logic to computer science.
 - 4. Determine whether a solution is possible in a variety of circumstances.
 - 5. Count the number of solutions in a variety of circumstances.
 - 6. Optimize a solution in a variety of circumstances.

- B. Perform the mathematical proofs.
 - 7. Demonstrate sets and apply set operations.
 - 8. Demonstrate the cartesian product.

- C. Use and understand the concept of recursion.
 - 9. Demonstrate Venn diagrams with sets.
 - 10. Demonstrate Demorgan's law.

- D. Use variety of counting principle.
 - 11. Demonstrate equivalence relation.
 - 12. Define and use partitions.

- E. Use graph theories.
 - 13. Represent graphs as pictures.
 - 14. Apply graph theory to applications.
 - 15. Use adjacency and incidence matrices.
 - 16. Create Hamilton paths and cycles.
 - 17. Demonstrate Dijkstra's algorithm.

- F. Use Boolean Algebra.
 - 18. Create a truth table from a Boolean expression.
 - 19. Represent Boolean expression as sums of products.
 - 20. Define logic gates and related properties.
 - 21. Create Boolean expressions from circuits.
 - 22. Use logic gates to create circuits.
 - 23. Use Karnaugh maps to minimize circuits and Boolean expressions.

- G. Use the principles of grammars and related properties.
 - 24. Define grammars and related properties.
 - 25. Use phrase-structure grammars.
 - 26. Use finite-state machines.

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

College Catalog

<https://www.kckcc.edu/academics/catalog/index.html>

College Policies and Statements

<https://www.kckcc.edu/about/policies-statements/index.html>

Accessibility and Accommodations

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.