



# ICS 141 – Discrete Mathematics for Computer Science I

## 3 Credits (CRN 60124) Spring 2019

### Online

Welcome to Discrete Mathematics for Computer Science I. In this course, you will be introduced to Logic, Proofs, Set Theory, Theory of Algorithms, Theory of Counting, Induction, and Probability. In this course you will learn to:

- Master precision in formal systems.
- Understand the concept of proofs as a chain of inferences.
- Apply formal rules of Algorithms to problem solving.
- Be able to develop a rigorous argument to support a concept.

This course completes the Foundation Symbolic Reasoning requirement and the Foundations Quantitative Reasoning requirement.

## Instructor Information

Instructor: David Maxson

Contact: [David.Maxson@hawaii.edu](mailto:David.Maxson@hawaii.edu)

Office Hours: Online. As a minimum, I will be available to answer questions on Mondays and Wednesdays from noon to 1:00 pm. Please submit all questions to Private Message in Lulima.

Term: Spring 2019

## Windward Community College Mission Statement

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide the Ko'olau region of Oahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

## Catalog Description

This course covers logic, sets, functions, matrices, algorithmic concepts, mathematical reasoning, recursion, counting techniques, and probability theory. (3 hours lecture)

Pre-Requisite(s): Grade of "C" or better in MATH 103 or placement into MATH 135 or higher, or consent of instructor.

## Other Requirements

Each student will be required to use Laulima. A Laulima account from UH Manoa has been created for you. Instructions for accessing your account will be provided in class.

## Student Learning Outcomes

As a result of taking this course, students can expect to attain the following outcomes:

- Analyze issues and apply mathematical problem solving skills to plan courses of action in decision-making situations.
- Solve problems by using basic mathematical formal logic, proofs, recursion, analysis of algorithms, sets, combinatorics, relations, functions, matrices and probability.

## Foundations Hallmarks

ICS 141 fulfills 3 credits of the General Education requirements (Foundations: Symbolic) for both an A.A. degree at WCC and a Bachelors degree at UH Manoa. Consequently, it meets the following hallmarks of the symbolic reasoning (FS) requirement:

1. Students will be exposed to the beauty, power, clarity and precision of formal systems.
2. Instructors will help students understand the concept of proof as a chain of inferences.
3. Instructors will teach students how to apply formal rules or algorithms.
4. Students will be required to use appropriate symbolic techniques in the context of problem solving, and in the presentation and critical evaluation of evidence.
5. The course will include computational and quantitative skills.
6. Instructors will build a bridge from theory to practice and show students how to traverse this bridge.

ICS 141 fulfills 3 credits of the General Education requirements (Foundations: Quantitative Reasoning) for both an A.A. degree at WCC and a Bachelors degree at UH Manoa. Consequently, it meets the following hallmarks of the quantitative reasoning requirement:

1. Provide students with theoretical justifications for, and limitations of, mathematical or statistical methods, and the formulas, tools, or approaches used in the course.
2. Include application of abstract or theoretical ideas and information to the solution of practical quantitative reasoning problems arising in pure and applied research in specific disciplines, professional settings, and/or daily and civic life.
3. Provide opportunities for practice and feedback that are designed to help students evaluate and improve quantitative reasoning skills by including a course component at least once per week with a maximum 30:1 student to teacher ratio.
4. Be designed so that students will be able to:
  - a. identify and convert relevant quantitative information into various forms such as equations, graphs, diagrams, tables, and/or words.
  - b. select appropriate techniques or formulas, and articulate and evaluate assumptions of the selected approaches.
  - c. apply mathematical tools and perform calculations (including correct manipulation of formulas).

- d. make judgements, create logical arguments, and/or draw appropriate conclusions based on the quantitative analysis of data, the assumptions made, the limitations of the analysis, and/or the reasonableness of results.
- e. effectively communicate those results in a variety of appropriate forms.

## Course Content

ICS 141 includes many of the major topics of mathematics and computer science theory. This includes logic, sets, functions, matrices, mathematical reasoning and counting techniques.

Students will:

- master precision in working with formal systems
- understand the concept of proof as a chain of inferences
- apply formal rules or algorithms to problem solving
- use appropriate symbolic techniques in the context of problem solving, and in the presentation and critical evaluation of evidence.
- master developing a rigorous argument to support a concept.

## Class Times and Location

This is an online class. All lessons and interaction will be through Laulima.

## Assessment Tasks and Grading

Your final grade will be determined using a series of assignments. There will be a total of 14 assignments. Assignments are worth 20 points each. The maximum number of points possible is 280.

Assignments are due two weeks after they are assigned. You may turn them in up to three weeks after the due date but there will be a three point penalty. If there are mistakes in your assignment you will have the chance to resubmit it for a higher grade. The only due date for resubmissions is May 2, 2019. No work will be accepted after that date. There will be no exceptions to the final due date.

Your letter grade is based upon the number of points you earn:

- A – 252 to 280 points.
- B – 224 to 251 points.
- C – 196 to 223 points.
- D – 140 to 195 points.
- F – 0 to 139 points.

# Learning Resources

Your textbook for this class is Epp's *Discrete Mathematics with Applications* (4<sup>th</sup> edition) from Cengage. There is more than one version of the 4th edition. It is crucial that you have the correct version for this class. The ISBN for the version of the textbook we are using is 9780495391326.

We will use Lulima for submitting and returning all assignments. All grades will be posted in Lulima and you will be able to track your progress by utilizing the grade book. In addition, there will be discussion boards in Lulima where you may post or answer questions. Use the private message tool in Lulima to contact the instructor.

## Other resources

- The University of Hawaii Community Colleges (UHCC) is offering an online tutorial service called tutor.com beginning this semester. You can access it on or after January 7, 2019 through MyUH. A tutorial on how to use it can be found at <http://go.hawaii.edu/XGG>
- Tutoring may be available from the TRIO office in the Library or at the Math Lab on the WCC campus.
- All public computers at WCC have computers configured with all of the software needed for this class.

## Policies

### Disabilities Accommodation Statement

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached by phone at 235-7448, by email at [lemke@hawaii.edu](mailto:lemke@hawaii.edu), or by stopping by her office in Hale 'Akoakoa 213 for more information.

### Title IX

Title IX prohibits discrimination on the basis of sex in education programs and activities that receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual harassment and gender-based harassment, including harassment based on actual or perceived sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual exploitation; domestic violence; dating violence; and stalking. For more information regarding your rights under Title IX, please visit: [https://windward.hawaii.edu/Title\\_IX/](https://windward.hawaii.edu/Title_IX/).

Windward Community College is committed to the pursuit of equal education. If you or someone you know has experienced sex discrimination or gender-based violence, Windward CC has resources to support you. To speak with someone confidentially, contact Karla Silva-Park, Mental Health Counselor, at 808-235- 7468 or [karlas@hawaii.edu](mailto:karlas@hawaii.edu) or Kaahu Alo, Designated Confidential Advocate for Students, at 808-235- 7354 or [kaahualo@hawaii.edu](mailto:kaahualo@hawaii.edu). To make a formal report, contact the Title IX Coordinator at 808-235-7393 or [wcctix@hawaii.edu](mailto:wcctix@hawaii.edu).

## **Academic Dishonesty – Cheating and Plagiarism**

You are responsible for the content and integrity of all work you submit. The guiding principle of academic integrity will be that all files, work, examinations, reports, and projects that you submit are your own work. See pages 15 and 16 of the Windward Community College catalog for further clarification.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

- Students will receive a failing grade for plagiarized assignments.
- All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

## **Netiquette**

Whenever you post something to the discussion board or other online forums, you are expected to follow proper netiquette. Be respectful at all times. Do not use obscene language or make disparaging comments, even if it is meant as a joke. Remember that others cannot see your facial expression nor hear your tone of voice, so they will not know you are trying to be witty. Do not use all caps. Using all caps is normally interpreted to be shouting.

## **Discussion Boards**

Discussion boards are to be used for class work only. Do not post political or other comments or statements, nor solicit sales for any type of product. Your instructor will be monitoring all communication in Lulima and will take appropriate action when necessary

## **Alternate Contact Information**

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

Location: Alakai 121  
Phone: 808-235-7422  
Email: [wcaa@hawaii.edu](mailto:wcaa@hawaii.edu)

## **A Final Thought**

A computer is a computing machine. Everything it does involves numbers and mathematics, even when it doesn't seem to (such as writing a paper). Discrete Mathematics gives a basic understanding of the most common mathematical concepts used to create professional programs. You will need to study and, possibly, go through a section more than once to understand most of these concepts. But if you stick with it and apply these concepts to your programs you will be rewarded with applications that operate efficiently and correctly. Good luck!