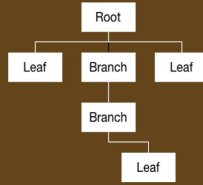




$L1 = \{aa, acc, bab, cda\}$



ICS 241  
Discrete Math for  
Computer Science II

# ICS 241 – Discrete Math for Computer Science II (CRN 60125) Spring 2019

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## 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 Tuesdays and Thursdays from noon to 1:00 pm. Please submit all questions to Private Message in Laulima.

## 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 O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

## Catalog Description

Includes program correctness, recurrence relations and their solutions, divide and conquer relations, graph theory, trees and their applications, Boolean algebra, introduction to formal languages and automata theory.

## Student Learning Outcomes

The Student Learning Outcomes for this course are:

- Analyze issues and apply more complex mathematical problem solving skills to plan courses of actions in high-level decision-making situations.
- Utilize such tools as graphs, trees, boolean algebra, and recurrence relations.
- Explain discrete math concepts such as formal languages, finite-state machines, and program correctness.

## Foundations Hallmarks

ICS 241 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 241 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 241 includes many of the major topics of mathematics and computer science theory. This includes boolean algebra, graphs, trees, formal languages, and finite state automata.

Students will:

- master precision in working with formal systems.
- use appropriate symbolic techniques in the context of problem solving, and in the presentation and critical evaluation of evidence.
- master graph techniques.
- understand how computer languages are formulated.
- follow an instruction through finite state automata.

## Class Times and Location

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

## Assignment Tasks and Grading

Your final grade will be determined using a series of assignments. There will be a total of 13 assignments. Assignments are worth 20 points each. The maximum number of points possible is 260.

Assignments are due two weeks after they are assigned. You may turn them in up to three weeks after the due date unless the assignment due date is May 2, 2019, 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 will be determined by the number of points you earn. There are 13 assignments for a total of 260 points:

- A: 234 – 260 points
- B: 208 – 233 points
- C: 182 – 207 points
- D: 130 – 181 points
- F: 0 – 129 points

## Learning Resources

Your textbook for this class is Epp's *Discrete Mathematics with Applications* (4th 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 Laulima for submitting and returning all assignments. All grades will be posted in Laulima and you will be able to track your progress by utilizing the grade book. In addition, there will be discussion boards in Laulima where you may post or answer questions. Use the private message tool in Laulima 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 in 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 page 16 of the Windward Community College catalog for further clarification.

## **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!