



UNIVERSITY of HAWAII®  
**WINDWARD**  
COMMUNITY COLLEGE

### **MATH 115 INTRODUCTION TO STATISTICS AND PROBABILITY**

3 Credits (CRN 60363)

Online via Lulima

INSTRUCTOR:	Andrew Won
OFFICE:	Hale Kako'o 107
OFFICE HOURS:	TR 4 ~5 P.M. (via ZOOM) TR 10~11 A.M. (Walk-in)
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EFFECTIVE DATE:	January 7~May 2, 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 O'ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.*

### **CATALOG DESCRIPTION**

Utilizes basic statistical topics including measures of central tendency and dispersion, classification of variables, sampling techniques, elementary probability, normal and binomial probability distributions, tests of hypothesis, linear regression and correlation in order to solve problems. (3 hours lecture)

Pre-Requisite(s): Grade of C or better in Math 25, 26, 28, 29, 75X or higher or equivalent, satisfactory math placement test score, or consent of instructor.

WCC: FQ

### **Activities Required at Scheduled Times Other Than Class Times**

Homework; consultation with instructor.

### **STUDENT LEARNING OUTCOMES**

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

1. Calculate and interpret statistical information.
2. Calculate and interpret probabilities for binomial or normal distributions, including the use of the Central Limit Theorem.
3. Demonstrate the use of inferential statistics.
4. Utilize appropriate statistical terminology and mathematical symbols to effectively communicate mathematics in written and/or oral form.

Note: All SLOs assessments are embedded in class activities, homework, or Exams.

This course syllabus is subject to change.

## FOUNDATIONS QUANTITATIVE REASONING HALLMARKS

Math 115 also fulfills 3 credits of the General education requirements (Foundations Quantitative Reasoning) for both an A.A. degree at WCC and a Bachelor's degree at 4 year UH institutions. 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 judgments, 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; and
  - e. effectively communicate those results in a variety of appropriate formats.

## COURSE CONTENT

<b>Concepts or Topics</b> ( <i>What students should know or understand</i> )	<b>Skills or Competencies</b> ( <i>What students should be able to do in order to complete the student learning outcomes</i> )
<ul style="list-style-type: none"> <li>• Data Collection</li> <li>• Descriptive Statistics</li> <li>• Probability</li> <li>• Discrete Probability Distributions</li> <li>• The Normal Probability Distribution</li> <li>• Sampling Distributions</li> <li>• Estimating the Value of a Parameter</li> <li>• Hypothesis Tests Regarding a Parameter</li> <li>• Inferences on Categorical Data</li> </ul>	<ol style="list-style-type: none"> <li>1. a positive, inquiring attitude towards</li> <li>2. learning mathematics;</li> <li>3. setting aside adequate time for studying and working of problems;</li> <li>4. reading the text carefully and making use</li> <li>5. of other learning materials whenever</li> <li>6. necessary;</li> <li>7. seeking assistance from the instructor and the Math Lab personnel whenever necessary;</li> <li>8. completing assignments by the designated date;</li> <li>9. regular class attendance, participation and maintaining accurate class notes.</li> </ol>

This course syllabus is subject to change.

## COURSE TASKS

The mode of instruction will be primarily through weekly activities, with focus on logical and analytical thinking to solve problems involving the concepts of statistics and. The new material will be introduced by the instructor in every lecture, and then the student will apply the new material to textbook problem sets and hands-on activities and realistic homework problems. The goal for this course is not just getting the correct answer but to build the ability to explain how to obtain the solution and why the solution is correct. Students will be expected to work both independently and collaboratively during weekly activities.

The student will demonstrate competency in the objectives by participating in and completing all weekly activities, by completing and submitting in all homework assignments as scheduled, by taking midterm exams, and by taking a final exam over concepts and skills covered in the entire course. The midterm exams and the final exam are to be taken in a testing center without any references unless otherwise stipulated by the instructor.

It is the responsibility of the student to obtain and complete all assignments that are given in any week for which the student is unable to attend. Unless permission is granted by the instructor beforehand, assignments and exams must be completed and submitted to the instructor at the specified date and time.

Points will be assigned to each of the following course work:

- **Weekly Activities (10%).** As the primary mode of instruction for this course is weekly activities, online participation in Lualima will be required throughout the semester. All attachment must be prepared in your own hand-writing and be saved as a single PDF file before posting. **Each weekly activity will close at the Friday midnight. There will be no make-up for missed weekly activities.**
- **Homework (10%).** Homework from the textbook will be assigned weekly. All homework must be submitted on time in the appropriate area in Lualima. All homework must be prepared in your own hand-writing and be saved as a single PDF file before submitting. **No late homework will be accepted.**
- **Handout (10%).** In addition to the weekly homework from the textbook, there will be a handout assignment from Chapter 1, 2, 3, 9, and 10. All handout assignments must be submitted on time in the appropriate area in Lualima. All handout must be prepared in your own hand-writing and be saved as a single PDF file before submitting. **No late handout will be accepted.**
- **Midterm Exams (40%).** There will be three midterm exams each covering specific chapters of the textbook (i.e., these exams will not be cumulative). Although announcements will be made in advance, it is your responsibility to check Tentative Schedule below for midterm exam dates. All midterm exams will be proctored at a local testing center of your choice and must be taken on the day specified. (See <http://www.hawaii.edu/dl/testcenters>.)
- **Project (10%).** There will be a short project. The milestone for the project is: (1) Appendix A (handout from Chapter 3); (2) Appendix B (handout from Chapter 9); (3) Appendix C (handout from Chapter 10); and Final Draft (putting all together). Detailed instructions will be given in throughout the semester. See Tentative Schedule below.
- **Final Exam (20%).** There will be one cumulative exam at the end of the course. See Tentative Schedule below for the final exam date. Final Exam will be proctored at a local

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testing center of your choice and must be taken on the day specified. (See <http://www.hawaii.edu/dl/testcenters>.) **If you do not take the final exam, you will automatically receive a grade of F for this course.**

- **Make-up.** Make-up opportunity for a midterm exam or final exam will be possible only upon a timely presentation of a serious and justified explanation of the student's absence from the class test. The instructor has the right to request documentation of the student's absence from the class and to determine if the absence from the class test is justified. A make-up test must be taken by the deadline set by the instructor.

**Notes:**

- If you are unable to attend class on an exam day, discuss your situation with the instructor as soon as possible **before** the exam day. It may be possible for you to take the exam earlier than the specified day/time.
- If you unexpectedly must be absent on an exam day, notify the instructor before the end of the day via email. If the reason is justified, then a make-up exam will be scheduled.
- For each student, no more than one make-up exam may be granted.
- There are no re-tests in this course.

- **Evaluation.**

Weekly Activities (ACT)	10%
Homework (HW)	10%
Handout (HO)	10%
Project	10%
Midterm Exams	40%
Comprehensive Final Exam	20%
Total	100%

- **Course Grade.**

Letter Grade	Definition
A	90%-100% of the cumulative points possible
B	80%-89% of the cumulative points possible
C	70%-79% of the cumulative points possible
D	60%-69% of the cumulative points possible
F	Less than 60% of the cumulative points possible
CR	70% or above of the cumulative points possible
NC	Less than 70% of the cumulative points possible
N	See definition listed below
W	Official Withdrawal
I	See below

- CR/NC grades require written instructor consent. Students must apply for CR/NC grading option at the Admissions Office by the posted deadline. If a student does not apply for CR/NC grading option at the Admissions Office by the required

deadline and if s/he does not withdraw, a letter grade (A, B, C, D, or F) will be assigned for the course.

- The N grade indicates that the student has worked conscientiously, attended regularly, finished all work, fulfilled course responsibilities, and has made measurable progress. However, either the student has not achieved the minimal student learning objectives and is not yet prepared to succeed at the next level, or the student has made consistent progress in the class but is unable to complete the class due to extenuating circumstances, such as major health, personal or family emergencies.
- The W grade is given only when the student officially withdraws from the course by the posted deadline.
- *The I grade is a temporary grade given at the instructor's option when a student has failed to complete a small part of a course because of circumstances beyond his or her control. A student may qualify for the I grade if (a) they are unable to take the final exam and (b) taking the final exam could possibly raise their course grade. The I grade is given only after a student's request and the instructor's approval.*

## LEARNING RESOURCES

Required Textbook: Sullivan, M. 2018 *Fundamentals of Statistics*. 5<sup>th</sup> ed. Pearson.

Required Technology Tool: Two-variable statistical calculator.

MATH LAB: La'akea 220 – free drop-in tutorial assistance

Tutor.com Online Tutorial Assistance: <https://windward.hawaii.edu/tudor.com/>

OLA (UH online tutoring program): <https://manoa.hawaii.edu/ola/>

TRiO Student Support Services: [https://windward.hawaii.edu/trio/Student\\_Support\\_Services.php](https://windward.hawaii.edu/trio/Student_Support_Services.php)

Wolfram Alpha: <http://www.wolframalpha.com>

Khan Academy Videos: <https://www.khanacademy.org/math>

Ka Piko is WCC's academic support hub. Please visit: <https://windward.hawaii.edu/kapiko/>

## ADDITIONAL INFORMATION

- **Grading on Homework, Handout, Weekly Activities, Midterm Exams, and Final Exam.** To receive full marks for problems done on any graded course work, you must show your work neatly and completely as well as provide clear written explanations, in full sentences, when it is asked for. Partial credit may be awarded.
- **Absences.** It is your responsibility to participated in all weekly activities. Even if you are absent, you are responsible for those topics, activities, and examples covered in the week you missed. Furthermore, you are responsible for obtaining any important announcements and assignments given during the week you missed. If you are absent frequently or for an extended period of time, contact the instructor as soon as possible to discuss your situation.
- **Student Expectations.** You need to login the course (Laulima) at least 3 times each week and spend at least 12 hours per week on the course. Homework must be turned in on time and exams taken during the days specified.
- **Practice.** For each chapter, as you read through each section, it is recommended that you write down the words, phrase or math symbols and their meanings, formulas, and properties/rules that are important for each activity. It is important for you to know these.

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After each section has been covered in class, try all odd-numbered problems in EXERCISES at the end of the section. The answers to these selected problems are available in the back of the textbook. Then do as many other problems in the same activity as you feel is necessary to help you learn and understand the material and become comfortable with the concepts and/or properties. If you have difficulty solving problems in the exercises, review carefully the discussions in the activity and your class notes. If, after checking these sources and trying to find your mistakes, you are still unable to solve a problem correctly, make a note of the exercise number so that you can ask someone for help with that problem. You are also encouraged to reach out to the instructor for additional assistance.

Mathematics is not a spectator sport. To succeed in mathematics, you must do problems. It is often necessary to practice a skill more than the instructor requires. For example, a textbook may provide 50 practice problems in a section and the instructor may assign only 25 of them. However, some students may need to do 30, 40, or all problems.

- **Laulima.** All instructions, including discussions and weekly activities, will be posted in Laulima each Monday, unless otherwise announced. Although there will be no formal lecture, a brief note will be given each week. The syllabus, course calendar, homework schedule, grades, etc. are all viewable through Laulima. Check Laulima frequently to stay up to date. I'll be logging in at least once a day Monday through Friday. **(There will be no instruction on weekends: all questions directed to the instructor must be posted in the appropriate area in Laulima by the early Friday afternoon. Questions posted in the late afternoon on Friday or on weekends will be replied on the following Monday.)**
- **Calculators.** A calculator with two-variable statistical feature is required in this course.
- **Testing Center.** You must provide contact information for your testing center in the first week of the semester. (There will be a forum thread for you to post this information in Week 1. See <http://www.hawaii.edu/dl/testcenters> for the testing centers in UH system.) If you are a WCC student, you must take all exams, including the final exam, at WCC Testing Center: WCC Testing Center operates based on "walk-in." (Students from campuses on O'ahu are welcome and encouraged to take exams at WCC Testing Center.)
- **Communication.** It is your responsibility to stay in communication with the instructor. The instructor may need to contact you throughout the semester and will do so via email and/or phone. It is your responsibility to check your UH email on a regular basis.
- **Student Conduct.** Please respect your fellow students (peers) and the instructor and act accordingly.
- **Electronic Devices.** The usage of electronic devices, including two-way communications devices such as cell phones, is prohibited during any proctored exams. (Cell phones must be silenced and put away when entering the testing room.)
- **Academic dishonesty will not be tolerated.** All suspected cases will be investigated and reported to the Vice Chancellor for Student Affairs. Punishments will vary, but they may include failure to the course. See <http://windward.hawaii.edu/Policies/> for more information on the UH system-wide student conduct code.

- **MySuccess.** At Windward community college, we want every student to be successful. MySuccess is a system wide effort that seeks to support students early in the semester when they first begin having difficulty in class. If the instructor feels that you are having difficulty in this course within the first few weeks of the semester (e.g. missing class, missing assignments, or low test scores) and that you would really benefit from being connected to resources outside of the classroom, the instructor may refer you to your assigned counselor. Once referred, MySuccess will:
  - Call you and send an email to your Hawaii.edu account to let you know about the referral from the instructor; and
  - Have the MySuccess team follow up with you by phone or email to find out what kinds of help you might need and connect you with the necessary resources to help you devise a strategy for success.

If the instructor refers you to your assigned counselor, please know that the instructor is doing so to connect you with all the help you may need to do well this course. Please be advised that your success in this course is of utmost importance.

### **DISABILITIES ACCOMMODATIONS**

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 at 235-7448, [lemke@hawaii.edu](mailto:lemke@hawaii.edu), or you may stop by Hale 'Ākoakoa 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, WCC has resources to support you. To speak with someone confidentially, contact the Mental Health & Wellness Office at 808-235- 7393 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, Karla K. Silva-Park, at 808-235-7468 or [karlas@hawaii.edu](mailto:karlas@hawaii.edu).

### **ACADEMIC INTEGRITY**

Work submitted by a student must be the student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

Students can upload papers to <http://www.TurnItIn.com> to have papers checked for authenticity, highlighting where the paper potentially fails to appropriately reference sources.

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.

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### 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: [wccaa@hawaii.edu](mailto:wccaa@hawaii.edu)

### Important College Deadlines

Last Day for 100% Refund, Fall	Jan 15, 2019
Last Day for 50% Refund, Fall	Jan 30, 2019
Last Day to Withdraw without a "W" Grade, Fall	Jan 30, 2019
Last Day to Withdraw with a "W" Grade, Fall	Mar 25, 2019
Last Day to Establish credit/no-credit and audit options, Fall	Mar 25, 2019

### Tentative Schedule (Subject to Change)

- Exam 1, 2, 3, and Final Exam must be taken at a testing center on the specified dates.

Week of	Weekly Activities and Discussions (ACT=Activity; HW=Homework Assignment; HO=Handout Assignment)
JAN 7	<ul style="list-style-type: none"> <li>Orientation/Questionnaire</li> <li>All non-WCC students must provide the location and contact information of your testing center by the end of the week. (See the related forum topic in Week 1 in Laulima.) Note: All WCC students must take exams at WCC Testing Center: appointment is not necessary.</li> <li>Lesson: CH1, CH2</li> <li>HO1 (CH1): Sampling due (Midnight Thursday)</li> <li>ACT due (Midnight Friday)</li> </ul>
JAN 14	<ul style="list-style-type: none"> <li>Lesson: CH2, CH3</li> <li>HO2 (CH2) due (Midnight Sunday)</li> </ul>
JAN 21	<ul style="list-style-type: none"> <li><b>No instruction (Holiday, Monday JAN 21)</b></li> <li>Lesson: CH3</li> <li>ACT due (Midnight Friday)</li> <li>HW1 (3.1, 3.2) due (Midnight Sunday)</li> </ul>
JAN 28	<ul style="list-style-type: none"> <li>Lesson: CH3</li> <li>HO3 (CH3) handed out</li> <li><b>Exam 1 (75 min; CH1~CH3; proctored; Thursday 1/31)</b></li> <li>HW2 (3.4, 3.5) due (Midnight Sunday)</li> </ul>
FEB 4	<ul style="list-style-type: none"> <li>HO3 due (Midnight Monday)</li> <li>Lesson: CH5</li> <li>ACT due (Midnight Friday)</li> <li>HW3 (5.1-5.4) due (Midnight Sunday)</li> </ul>
FEB 11	<ul style="list-style-type: none"> <li>Lesson: CH6</li> <li>HW4 (6.1, 6.2) due (Midnight Sunday)</li> </ul>
FEB 18	<ul style="list-style-type: none"> <li><b>No instruction (Holiday, Monday FEB 18)</b></li> <li>Lesson: CH7</li> <li>ACT due (Midnight Friday)</li> <li>HW5 (7.2, 7.4) due (Midnight Sunday)</li> </ul>
FEB 25	<ul style="list-style-type: none"> <li>Lesson: CH7</li> </ul>

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	<ul style="list-style-type: none"> <li>• <b>Exam 2 (75 min; CH5~CH7; proctored; Thursday 2/28)</b></li> <li>• <b>No Instruction (Excellence in Education Day, Friday MAR 1)</b></li> <li>• ACT due (Midnight Friday)</li> <li>• HW6 (8.1, 8.2) due (Midnight Sunday)</li> </ul>
MAR 4	<ul style="list-style-type: none"> <li>• Lesson: CH8</li> <li>• ACT due (Midnight Friday)</li> <li>• HW7 (9.1) due (Midnight Sunday)</li> </ul>
MAR 11	<ul style="list-style-type: none"> <li>• Lesson: CH9</li> <li>• HO4 (CH9) handed out</li> <li>• ACT due (Midnight Friday)</li> <li>• HW8 (9.2) due (Midnight Sunday)</li> </ul>
MAR 18	<ul style="list-style-type: none"> <li>• <b>No Instruction (Spring Recess)</b></li> </ul>
MAR 25	<ul style="list-style-type: none"> <li>• Lesson: CH9, CH10</li> <li>• HO4 due (Midnight Monday)</li> <li>• <b>No Instruction (Holiday, Tuesday MAR 26)</b></li> <li>• ACT due (Midnight Friday)</li> <li>• HW9 (9.3, 10.1) due (Midnight Sunday)</li> </ul>
APR 1	<ul style="list-style-type: none"> <li>• Lesson: CH10</li> <li>• ACT due (Midnight Friday)</li> <li>• HW10 (10.2) due (Midnight Sunday)</li> </ul>
APR 8	<ul style="list-style-type: none"> <li>• Lesson: CH10</li> <li>• HO5 (CH10) handed out</li> <li>• Project Summary Report Template handed out</li> <li>• <b>Exam 3 (75 min; CH8~CH10; proctored; Thursday 4/11)</b></li> <li>• ACT due (Midnight Friday)</li> <li>• HW11 (10.3, 10.4) due (Midnight Sunday)</li> </ul>
APR 15	<ul style="list-style-type: none"> <li>• Lesson: CH4</li> <li>• HO5 due (Midnight Monday)</li> <li>• ACT due (Midnight Friday)</li> <li>• HW12 (4.1-4.3) due (Midnight Sunday)</li> </ul>
APR 22	<ul style="list-style-type: none"> <li>• Lesson: 12.1, 12.2</li> <li>• Project draft submitted to receive my feedback (Midnight Tuesday)</li> <li>• Project completed and submitted (Midnight Thursday)</li> <li>• ACT due (Midnight Friday)</li> <li>• HW13 (12.1, 12.2) due (Midnight Sunday)</li> </ul>
APR 29	<ul style="list-style-type: none"> <li>• Review</li> <li>• <b>Last of instruction (Thursday May 2)</b></li> </ul>
MAY 6	<b>FINAL EXAM (120 min; comprehensive; proctored; 5/8)</b>