

## MATH 115 INTRODUCTION TO STATISTICS AND PROBABILITY

3 Credits

Time: TR 8:30 A.M.~9:45 A.M.

CRN 61162

**INSTRUCTOR:** Andrew Won

**OFFICE:** Hale Kako'o 107

**OFFICE HOURS:** MWF 10-11 A.M. and TR 12-1 P.M.

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**EFFECTIVE DATE:** August 21~December 15, Fall 2017

### 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

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.

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

Homework; consultation with instructor.

### STUDENT LEARNING OUTCOMES

Upon completion of the course, the student will be able to:

1. Demonstrate proficiency in graphing, statistical data, calculating measures of central tendency, measures of variation, percentiles, correlation coefficients, and regression line.
2. Interpret statistical information provided in graphs, in summary measures (central tendency, dispersion, percentile), and in the correlation coefficient.
3. Solve probability problems involving compound events, independent events, mutually exclusive events, and conditional probability.
4. Calculate and interpret probabilities for normal or binomial distributions, including the use of the Central Limit Theorem.
5. Demonstrate the use of inferential statistics.

6. 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, quizzes, or Exams.**

## COURSE CONTENT

*Concepts or Topics (What students should know or understand)*

- Data Collection
- Descriptive Statistics
- Probability
- Discrete Probability Distributions
- The Normal Probability Distribution
- Sampling Distributions
- Estimating the Value of a Parameter
- Hypothesis Tests Regarding a Parameter
- Inferences on Categorical Data

*Skills or Competencies (What students should be able to do in order to complete the student learning outcomes)*

1. a positive, inquiring attitude towards learning mathematics;
2. setting aside adequate time for studying and working of problems;
3. reading the text carefully and making use of other learning materials whenever necessary;
4. seeking assistance from the instructor and the Math Lab personnel whenever necessary;
5. completing assignments by the designated date;
6. regular class attendance, participation and maintaining accurate class notes.

## Course Tasks

The mode of instruction will be focusing on problem solving, logical and analytical thinking. The new material will be introduced by the instructor in every lecture, and then the student will apply the new material to text book problem sets. However, the goal for this procedure 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 cooperatively in small groups.

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

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

1. **HOMEWORK** Homework will be assigned weekly. All homework is to be turned in at the designated date. Late homework may be accepted with grade penalty.
2. **QUIZZES** A short quiz will be given weekly. Students must be present in class to take a quiz. Although announcements will be made during class, it is your responsibility to check Tentative Schedule below for quiz dates. The two lowest quiz scores will be dropped. There will be no make-up for missed quizzes.
3. **MIDTERM EXAMS** 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 during class, it is your responsibility to check Tentative Schedule below for midterm exam dates.

4. **PROJECT** There will be a short project. Details instructions will be given latter part of the semester. See Tentative Schedule below.
5. **FINAL EXAM** There will be one cumulative exam at the end of the course. See Tentative Schedule below for the final exam date.
6. **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 me 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 me 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.

Homework	30%
Weekly Quizzes (In-class)	10%
Midterm Exams (In-class)	30% (10% each)
Project	10%
Comprehensive Final Exam (In-class)	20%

Letter grades for the course are earned as follows:

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
W	Official Withdrawal
I	See below

- The N grade will not be given in this course.
- 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 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 and Materials

Textbook: Sullivan, M. 2014 *Fundamentals of Statistics*. 4<sup>th</sup> ed. Pearson.

- Option 1: Buy the printed textbook from the bookstore with an Access Code included.
- Option 2: Buy access to MyStatLab directly online and get the e-book included.

Required Technology Tool: TI-83, TI-83+, or TI-84+ calculator.

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

Brainfuse Online Tutorial Assistance: <https://windward.hawaii.edu/brainfuse/>

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)

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

## Additional Information

1. **Grading on Homework, Weekly Quizzes, 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.

2. **Absences.** It is your responsibility to attend every class meeting. Even if you are absent, you are responsible for those topics, activities, and examples covered in class that you missed. Furthermore, you are responsible for obtaining any important announcements and assignments given during the class 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.

3. **Practice.** For each chapter, as you read through each activity, 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.

After each activity has been done in class, try all selected problems (in blue) in EXERCISES at the end of the activity. The answers to these selected problems are available at 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 me 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. If you are an accomplished athlete, musician, or dancer, you know that long hours of practice are necessary to acquire a skill. Do not cheat yourself of the practice you need to develop skills taught in this course.

4. **Laulima.** The syllabus, course calendar, homework schedule, grades, etc. are all viewable through Laulima. Check Laulima regularly to stay up to date.

5. **Calculators.** A graphing calculator (TI-83, TI-83+, or TI-84+) is required. There are some TI-83+ calculators available in the library for students to borrow for the entire semester

6. **Communication.** It is your responsibility to stay in communication with the instructor. If you will be unable to make it to class for any reason, please inform your instructor so it may be determined if the absence is excused. The instructor may need to contact you throughout the semester and will do so via email. It is your responsibility to check your UH email on a regular basis.

7. **Electronic Devices.** The usage of electronic devices, including two-way communications devices such as cell phones, is prohibited during class. (Cell phones must be silenced when entering the classroom.)

8. **MyStatLab (MSL).** You are strongly recommended to utilize the online resources provided by Pearson (<https://www.pearsonmylabandmastering.com/northamerica/>). To register for a MSL account, you must have an access code (accompanying the printed textbook or purchase solely) and a course ID. The course ID for this course is **won37626**.

9. **Academic dishonesty will not be tolerated.** All suspected cases will be investigated and reported to the Dean. Punishments will vary, but may include failure to the course. See <http://windward.hawaii.edu/Policies/> for more information on the UH system-wide student conduct code.

### Tentative Schedule (Subject to Change)

Dates	Activities and Discussions
AUG 22, 24	Orientation Chapter 1
AUG 29, 31	Quiz 1; HW 1 Due (8/29) Chapter 2
SEP 5, 7	Quiz 2; HW 2 Due (9/5) Chapter 3
SEP 12, 14	Quiz 3; HW 3 Due (9/12) Chapter 4 Review for Exam 1
SEP 19, 21	<b>Exam 1 (9/19)</b> Chapter 4
SEP 26, 28	Quiz 4; HW 4 Due (9/26) Chapter 5
OCT 3, 5	Quiz 5; HW 5 Due (10/3) Chapter 6
OCT 10, 12	Quiz 6; HW 6 Due (10/10) Chapter 7 Review for Exam 2
OCT 17, 19	<b>Exam 2 (10/17)</b> Chapter 7
OCT 24, 26	Quiz 7; HW 7 Due (10/24) Chapter 8 Project Explained
OCT 31, NOV 2	Quiz 8; HW 8 Due (10/31) Chapter 9
NOV 7, 9	Quiz 9; HW 9 Due (11/7) Chapter 10 Review for Exam 3
NOV 14, 16	<b>Exam 3 (11/14)</b> Chapter 10 (continued)
NOV 21, 23	Quiz 10; HW 10 Due (11/21) Chapter 10 (continued) Thanksgiving Day—No Class (11/23)

NOV 28, 30	Quiz 11; HW 11 Due (11/28) 12.1, 12.2
DEC 5, 7	Project Due (12/5) Review for Final
DEC 14	Final Exam (08:30-10:30 A.M.)

### Important College Deadlines

Late Registration/Fee begins, Fall	Aug 21, 2017
In-Person Add/Drop Fee Begins, Fall	Aug 21, 2017
Last Day to Add/Late Register, Fall	Aug 25, 2017
Last Day for 100% Refund, Fall	Aug 25, 2017
Last Day for 50% Refund, Fall	Sep 12, 2017
Last Day to Withdraw without a "W" Grade, Fall	Sep 12, 2017
Last Day to Withdraw with a "W" Grade, Fall	Oct 30, 2017
Last Day to Establish credit/no-credit and audit options, Fall	Oct 3, 2017
Last Day to Make up an "I Grade" from Previous Spring	Oct 3, 2017

### 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 at 235-7448, [lemke@hawaii.edu](mailto:lemke@hawaii.edu), or you may stop by Hale 'Akoakoa 213 for more information.*