Columbus State Community College
Mathematics Department
Public Syllabus

Course Number and Name: STAT 2470 – Probability and Statistics for Engineering and the Sciences
Credit Hours: 4 semester credits (3 lecture and 2 lab hours per week)
Prerequisite: A grade of "C" or higher in MATH 1152 or MATH 1157 or MATH 1172

DESCRIPTION OF COURSE
STAT 2470 introduces probability theory, discrete and continuous random variables, probability distributions, expected value and variance, the normal distribution, point estimation, sampling distributions, one and two sample confidence intervals, one and two sample hypothesis testing, simple linear regression and correlation, Chi-Square goodness-of-fit test, analysis of variance, and multiple linear regression. Applications to problems in science, engineering, computer science, and related areas are explored. STAT 2470 is intended primarily for students needing a calculus-based course in probability and statistics.

COURSE GOALS
- To master the major concepts and methods of analysis in probability and statistics.
- To apply concepts and methods to applications in science, engineering, computer science, and related areas.
- To develop competence in problem recognition, calculator computation, and interpretation of results.
- To use R and the TI calculator as statistical tools.

INSTITUTIONAL LEARNING GOALS:
Columbus State Community College's Institutional Learning Goals are an integral part of the curriculum and central to the mission of the college. For this course (MATH XXXX), students are expected to demonstrate the skills associated with the Institutional Learning Goals identified below:
- #1 Critical Thinking
- #3 Quantitative Skills

Students are assessed on their achievement of these outcomes. Names will not be used when reporting results. Outcomes-based assessment is used to improve instructional planning and design and the quality of student learning throughout the college.

COLLEGE SYLLABUS STATEMENTS
Columbus State Community College required College Syllabus Statements on College Policies and Student Support Services can be found at www.cscc.edu/syllabus or on the College website Quick Links "Syllabus Statements".

REQUIRED TEXTBOOK, CALCULATOR AND OTHER RESOURCES
- This course uses an OER textbook provided through Blackboard.

- **A graphing calculator is REQUIRED.** The Texas Instruments' TI-84 (regular, Plus, Silver, etc.) graphing calculator is strongly recommended, fully supported, and approved for use during proctored assessments.

  Calculator Alternatives: Some students may prefer to use a CASIO-FX-9750GII, TI-Nspire (non CAS version), or a TI-83. These are less expensive options that are similar to the TI-84, and that are approved for use during proctored assessments. However, note that your instructor will primarily use the TI-84 when teaching, meaning that you will need to learn how to perform any necessary operations, using these other calculators, without your instructor's help.

  Other graphing calculators may be permitted. If you own a different calculator, please check with your current instructor to see if your calculator will be allowed during their proctored assessments.

  The TI-89, TI-92, TI-Nspire CAS, or other Computer Algebra System (CAS) calculators, are never allowed during proctored assessments.

  Your instructor may require that your graphing calculator's memory be reset (all RAM cleared) prior to each proctored assessment.

  The Columbus State Bookstore sells both the TI-84 and CASIO-FX-9750GII for your convenience. Additional resources supporting the use of the TI-84 and CASIO-FX-9750GII may be available at:
  http://www.cscc.edu/academics/departments/math/graphing-calculator.shtml.
- **R Statistical Software (REQUIRED)** This software is free to download onto your computer.
- Tutoring is available in the Learning Resource Center. See http://www2.cscc.edu/academics/departments/math/tutoring.shtml for location and posted hours.

INSTRUCTIONAL METHODS
Instructional methods may include face-to-face or video lectures or demonstration, face-to-face or virtual discussion, individual or group activities including the use of visual aids, graphing calculators, computers and/or other technologies. Students may be expected to participate in these activities during class and/or outside of class. Instructors may require class participation, collaborative learning, and peer review.

UNITS OF INSTRUCTION
1. Descriptive Statistics (1.3-1.4)
2. Probability (2.1-2.5)
3. Discrete Random Variables (3.1-3.6)
4. Continuous Random Variables (4.1-4.4)
5. Joint Probability Distributions (5.1-5.4)
6. Point Estimation (6.1-6.2)
7. Statistical Intervals Based on a Single Sample (7.1-7.3)

8. Tests of Hypothesis Based on a Single Sample (8.1-8.4)
9. Inferences Based on Two Samples (9.1-9.4)
10. The Analysis of Variance (10.1-10.2)
11. Simple Linear Regression and Correlation (12.1-12.5)
12. Multiple Regression (13.1-13.4)
13. Goodness-of-Fit Tests and Categorical Data Analysis (14.1-14.2)

METHODS OF EVALUATION

- Letter grades for the course will be awarded using a 90%-80%-70%-60% scale.
- A comprehensive Final Exam will account for between 25% and 35% of the course grade.
- R labs will account for 10% of the total course grade.

CALENDAR

Week 1: Descriptive Statistics (1.3-1.4)
Week 2: Probability (2.1-2.5)
Week 3: Discrete Random Variables (3.1-3.6)
Week 4: Continuous Random Variables (4.1-4.4)
Week 5: Joint Probability Distributions (5.1-5.4)
Week 6: Point Estimation (6.1-6.2)
Week 7: Review and Midterm
Week 8: Statistical Intervals Based on a Single Sample (7.1-7.3)
Week 9: Tests of Hypothesis Based on a Single Sample (8.1-8.4)
Week 10: Inferences Based on Two Samples (9.1-9.4)
Week 11: The Analysis of Variance (10.1-10.2)
Week 12: Simple Linear Regression and Correlation (12.1-12.5)
Week 13: Multiple Regression (13.1-13.4)
Week 14: Goodness-of-Fit Tests and Categorical Data Analysis (14.1-14.2)
Week 15: Review
Week 16: Final Exam