Washtenaw Community College Comprehensive Report

MTH 160 Basic Statistics
Effective Term: Fall 2021

Course Cover

College: Math, Science and Engineering Tech
Division: Math, Science and Engineering Tech
Department: Math & Engineering Studies
Discipline: Mathematics
Course Number: 160
Org Number: 12200
Full Course Title: Basic Statistics
Transcript Title: Basic Statistics
Is Consultation with other department(s) required: No
Publish in the Following: College Catalog , Time Schedule , Web Page
Reason for Submission: Three Year Review / Assessment Report
Change Information:
Outcomes/Assessment
Objectives/Evaluation
Rationale: While it has been two years since the last syllabus review, a recent assessment of Math 160 from Winter 2021 is prompting us to raise our expectations for students in the course. Likewise, we aim to align assessments and syllabus updates every two years, as appropriate. Lastly, this update will clarify a few of the objectives of the course. More specifically, data from the 2019 and 2021 assessments reveal rising success rates for three of the four learning outcomes in the course. The success rate for outcome four declined in the most recent assessment, but we still achieved our desired goal of at least 70% of students scoring at least 70% on each of the course outcomes. With this syllabus revision, we aim to promote a higher level of student success by raising our standard of success for each course outcome. Instead of aiming for 70% of students achieving at least 70% on each course outcome, we will now aim for at least 75% of students achieving at least 70% on each course outcome. Data below indicate the proportion of students achieving at least 70% on each course outcome in the last two assessments. Percentage of Students Earning >70% O1 O2 O3 O4 Winter 2019. 90% 88% 78% 84% Winter 2021. 94% 91% 82% 72%. By raising our standards, we hope to challenge both instructors and students in an effort to promote higher levels of success in Math 160. This course serves as a gateway for many students in the medical field and other areas (and it is also the Mathematics course with the highest enrollment at WCC), so our continuous improvement and reflection should incorporate higher success rates. Moreover, adding details to several of the course objectives as part of this revision may prove helpful to students seeking credit for Math 160 from outside institutions.
Proposed Start Semester: Fall 2021
Course Description: In this course, students will use elementary statistics to achieve statistical literacy. Emphasis is on interpretation and evaluation of statistical results. Broad topics include descriptive statistics, linear regression, basic probability theory and inferential statistics. Specific topics include describing data sets graphically and numerically, measures of center and spread, bivariate data and least squares regression, correlation, random variables, basic probability distributions, confidence intervals and hypothesis tests. A graphing calculator is required for this course. See the time schedule for current brand and model.

Course Credit Hours

Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60

Lab: Instructor: 0 **Student:** 0
Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 60 **Student:** 60
Repeatable for Credit: NO
Grading Methods: Letter Grades
Audit
Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Level 3

Requisites

General Education

Degree Attributes
Assoc in Applied Sci - Area 3
Assoc in Science - Area 3
Assoc in Arts - Area 3
MACRAO Science & Math
Michigan Transfer Agreement - MTA
MTA Mathematics

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify common statistical terminology, and represent qualitative and quantitative data in tables and graphs.
   Assessment 1
   Assessment Tool: Outcome-related common final exam questions
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students
   How the assessment will be scored: The selected set of common questions for this outcome from the approved department final exam will be scored with a rubric
   Standard of success to be used for this assessment: 75% of students will score at least 70% on the selected set of questions assessed for this outcome
   Who will score and analyze the data: Course mentor (coordinator)/department faculty

2. Interpret, plan, produce and apply descriptive statistics, including common quantitative measures for univariate data and common quantitative measures related to linear regression analysis of bivariate data.
   Assessment 1
   Assessment Tool: Outcome-related common final exam questions
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All

Number students to be assessed: 10-20% representative random sample of students

How the assessment will be scored: The selected set of common questions for this outcome from the approved department final exam will be scored with a rubric

Standard of success to be used for this assessment: 75% of students will score at least 70% on the selected set of questions assessed for this outcome

Who will score and analyze the data: Course mentor (coordinator)/department faculty

3. Interpret and apply probability, discrete probability distributions and common continuous probability distributions.
   Assessment 1
   Assessment Tool: Outcome-related common final exam questions
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students
   How the assessment will be scored: The selected set of common questions for this outcome from the approved department final exam will be scored with a rubric
   Standard of success to be used for this assessment: 75% of students will score at least 70% on the selected set of questions assessed for this outcome
   Who will score and analyze the data: Course mentor (coordinator)/department faculty

4. Interpret, plan, produce and apply inferential statistics.
   Assessment 1
   Assessment Tool: Outcome-related common final exam questions
   Assessment Date: Spring/Summer 2023
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students
   How the assessment will be scored: The selected set of common questions for this outcome from the approved department final exam will be scored with a rubric
   Standard of success to be used for this assessment: 75% of students will score at least 70% on the selected set of questions assessed for this outcome
   Who will score and analyze the data: Course mentor (coordinator)/department faculty

Course Objectives

1. Use standard statistics terminology to describe the output of technology, or written narrative, of inferential statistics.
2. Classify sampling methods, variables and types of data.
3. Recognize and critique varied descriptive statistical summaries such as tables, graphs and numerical measures.
4. Tabulate data, and prepare varied statistical summaries such as tables, graphs and numerical measures.
5. Construct and interpret a scatterplot for two variables.
6. Calculate and interpret the correlation coefficient for two variables.
7. Calculate and interpret the equation of the least squares regression line, and use it to predict values of the response variable from values of the explanatory variable.
8. Calculate and interpret basic probabilities via the fundamental probability principle, the addition rule, the rule of complements, conditional probability rules, and the multiplication rule.
9. Produce discrete probability distributions corresponding to empirical data or discrete random variables.
10. Interpret discrete probability distributions, and calculate the corresponding means and standard deviations.
11. Interpret and apply normal probability distributions from normal populations, distributions of sample means, and distributions of sample proportions.
12. Explore the Central Limit Theorem and summarize attributes of sampling distributions while recognizing their connection to the normal distribution.

13. Interpret, construct and apply confidence intervals and calculate sample sizes necessary, given a margin of error and confidence level.
14. Interpret and develop statistical hypotheses for one and two populations.
15. Make statistical tests of hypotheses about means and proportions for one and two populations using z and t distributions.
16. Interpret and make inferences based upon hypothesis tests using appropriate statistics terminology.
17. Translate results of inferential statistics into everyday language.

New Resources for Course

Course Textbooks/Resources

Textbooks
　　Navidi, W. and Monk B.. *Elementary Statistics (Enhanced edition with eBook & Connect Access)*, 3rd ed. McGraw Hill, 2019
Manuals
Periodicals
Software

Equipment/Facilities

Level III classroom
Other: calculator emulator software (such as TI-84 Plus SmartView and/or statistics software as specified by math department)

Reviewer	Action	Date
Faculty Preparer:		
Robert Klemmer	*Faculty Preparer*	*Jun 11, 2021*
Department Chair/Area Director:		
Lisa Manoukian	*Recommend Approval*	*Jun 21, 2021*
Dean:		
Victor Vega	*Recommend Approval*	*Jun 29, 2021*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Aug 04, 2021*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Aug 04, 2021*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Aug 05, 2021*