Washtenaw Community College Comprehensive Report

MTH 160 Basic Statistics
Effective Term: Winter 2024

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
Other:
Rationale: A primary reason for this syllabus review is that there has been a change with the digital platform/ebook used for the course. Secondly, language needs to be added that states how the sample of final exams used to assess each learning outcome should include both online/virtual and paper versions of the final that are in proportion with the total number of online/virtual and face-to-face students taking the course. Given that the recent (June 2023) assessment reveals a high success rate for students in all modalities of Math 160, there are no substantive content changes with this syllabus revision.
Proposed Start Semester: Winter 2024
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 2025
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students from both online/virtual and face-to-face sections of the course
   How the assessment will be scored: The selected set of common questions for this outcome from the paper and online versions of the approved department final exam will be matched and 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 2025
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   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 2025
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students from both online/virtual and face-to-face sections of the course
   How the assessment will be scored: The selected set of common questions for this outcome from the paper and online versions of the approved department final exam will be matched and 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 2025
   Assessment Cycle: Every Two Years
   Course section(s)/other population: All
   Number students to be assessed: 10-20% representative random sample of students from both online/virtual and face-to-face sections of the course
   How the assessment will be scored: The selected set of common questions for this outcome from the paper and online versions of the approved department final exam will be matched and 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 (Digital edition with ebook and ALEKS 360 Access)*, 4th ed. McGraw Hill, 2022

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 06, 2023*
Department Chair/Area Director:		
Nichole Klemmer	*Recommend Approval*	*Jun 07, 2023*
Dean:		
Tracy Schwab	*Recommend Approval*	*Jun 08, 2023*
Curriculum Committee Chair:		
Randy Van Wagnen	*Recommend Approval*	*Nov 09, 2023*
Assessment Committee Chair:		
Jessica Hale	*Recommend Approval*	*Nov 09, 2023*
Vice President for Instruction:		
Brandon Tucker	*Approve*	*Nov 09, 2023*

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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.
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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*