

**University of Minnesota- Twin Cities**

**Fall 2018**

**CI 1806**

**College Algebra through Modeling**

**Credits:** 3

**U of M Liberal Education requirements met:** Mathematical Thinking

**Instructor name**: Shannon Voeks

**Contact information**: 651-744-7986 shannon.voeks@spps.org

**Class times and location**: M, Tu, W, Th, F 2:49-4:00 PM

**Office hours**: 1:00–1:32 daily in Room 1041

**Textbook:**

College Algebra in Context – 3rd Edition

Harshbarger & Yocco

**Description**

  CI 1806 introduces students to the art of mathematical prediction through algebraic modeling and elementary probability theory. As a class that satisfies the University of Minnesota Mathematical Thinking Core requirement, topics support students’ understanding of the dual nature of mathematics. First, mathematics is a body of knowledge that relies upon a precise, symbolic means of communication and analysis. This aspect of mathematics is conveyed through a survey of simplification, solving and graphing techniques applied to a range of function types, including linear, polynomial, exponential and logarithmic functions. While students practice traditional algebraic methods, they may also use spreadsheets and graphing calculators to investigate the behavior of data sets. Students will learn to develop equations that accurately represent the behavior of real-world data and assess their goodness-of-fit.  All of the homework assignments strengthen students’ fluency in communicating with the symbols of mathematics.

Second, mathematics provides descriptive and problem-solving tools to address authentic questions in a wide range of disciplines. Models are drawn from a range of disciplines that include science, social sciences and education. Throughout the modeling activities, students are asked to generalize their solutions, to pose and answer related mathematics problems, and to develop precisely-stated algorithms and solution methods. These activities are intended to help students understand their own capacity to use mathematics to answer significant questions and to become lifelong users of mathematics.  Models are typically introduced through small group activities, although most are submitted individually to insure personal feedback for individual student growth. CI 1806 fulfills the University of Minnesota Liberal Education Core Requirement of Mathematical Thinking.

**Prerequisites for CI 1806**

The prerequisite for CI 1806 is three years high school math OR placement test score OR instructor consent.

**Required Materials**

* **Calculator** (your choice, anything with buttons that say log, ln , 10x). Graphing calculators are acceptable as well. Desmos is a free online calculator.

* **Binder-**Math Notebook and Folder

* **Textbook**

**Student Learning Outcomes (SLOs)**

 CI 1806 addresses the following SLOs as outlined at [http//academic.umn.edu/provost/teaching/cesl\_loutcomes.html](http://academic.umn.edu/provost/teaching/cesl_loutcomes.html)

**Identify, define, and solve problems.** You will improve your problem-solving abilities by creating mathematical models that will help you make predictions to see how the situation will evolve in the future (e.g., find the future value of an investment).

**Master a body of knowledge and a mode of inquiry.** You will increase your mathematical knowledge base, especially in the area of functions, and you will do a lot of the symbolic manipulation typically found in a first college mathematics course.

**Communicate effectively.** In this class, you will practice communicating mathematically in several ways. You will practice using the precise vocabulary and syntax of mathematics by writing equations and expressions correctly. As you write up your models, you will also practice translating between mathematical representations such as equations/expressions, graphs, tables of values, and precisely worded algorithms. Several assignments also allow you to practice communicating persuasively and creatively about the importance of your mathematical findings, for example, through creative writings and creating mathematical videos.

**Understand the role of creativity, innovation, discovery, and expression across disciplines.**During the modeling assignments in this class, you will develop your mathematical creativity extensively. First, you will create a mathematical approach that allows you to solve a realistic problem.  Different students will create different solutions, and by comparing their solutions, we will develop a deeper understanding of mathematical creativity. Second, each model requires you to extend or generalize your original solution so that it can address a wider range of related problems.  Finally, your final model asks you to identify a question that is important to you and to create a model to solve it. Mathematical creativity, including different solution methods developed by different students, is valued highly in this class.

**Effective citizenship and life-long learning.** This course assists your development as a citizen by helping you develop tools for analyzing and answering a wide range of real-world questions, including questions that you pose yourself. By giving you practice in asking mathematical questions and answering them, this class demonstrates that mathematics can become an authentic part of other classes and your personal life.

**Classroom Etiquette**

* Listen to your classmates carefully and give them useful but supportive feedback on their mathematical ideas.
* Computers or iPads should only be used for activities related to class.
* Electronic devices such as cell phones and music players must be turned off during class.

**Learning Goals**

* Fit an appropriate equation to data using algebraic techniques and using Excel.
* Evaluate how well the equation fits the data.
* Give mathematical evidence for your ideas.
* Represent real-world situations with equations, graphs, tables of values, diagrams, and algorithms that allow you to create mathematical solutions.
* Develop logical and organized models to address realistic scenarios, using the modeling process of *simplify*, *represent*, *solve*, *interpret* and *extend*.
* Communicate your solution precisely enough that others can implement it.
* Ask and answer your own mathematical questions (the *extend* section of our modeling activities).
* Generalize your solutions so that they address a wider range of scenarios (the *extend* section of our modeling activities).
* Learn basic probability theory including counting methods and conditional probability.

 **Statement on Late Assignments**

All assignments and models lose 10% of total points if they are not turned in on the due date. All assignments and models will become half the points 1 week after the due date. No time in class will be given to work on late assignments and models. **Communicate** with your teacher if you are having difficulty completing assignments.

**Statement on Extra Credit**

Extra credit will not be offered.

**Grading**

Students will receive two grades for this course, a St. Paul Public Schools grade and a University of Minnesota grade.

**Grade**

**U of MN%           SPPS%**

A   95 – 100          93 - 100

A-  90 – 95            90 – 93

B+  87 – 90           87 – 90

B    83 – 86           83 – 87

B-   80 – 83           80 – 83

C+  77 – 80           77 – 80

C   73 – 77           73 – 77

C-   70 – 73           70 – 73

D+  67 – 70           67 – 70

D    65 – 67           63 – 67

D-  Not Assigned  60 – 63

F     < 65            N     < 60

For the **University of Minnesota grade**, the weighting will be as follows:

Quarter 1   45%

Quarter 2   45%

Cumulative Final Exam  10% - Please see calendar for date and time.

For the **SPPS grade**, the weighting will be as follows:

Practice   20%

Models   40%

Tests/quizzes\*   40%

**\*There will be no retakes on tests.**

**\*February 26th will be our Field Day at the University of Minnesota.  Your attendance and participation on this day is required.  If you are unable to attend, you will have to do a makeup model assignment.**

**Attendance**

Students are expected to attend class every day. If a student is absent from class, they are responsible for all missed work. It will be very difficult to be successful if you are not in class.

**Plagiarism**

Students can work together to develop their ideas for a model, but when they turn in an individual model, all sentences should be substantially different from their study partners’ sentences.  The problem posed and answered in the Extend section should be different from their study partners’ problems, as well.  The consequences for plagiarism are: 1st offence- Student will be asked to do the assignment for half credit. All other offences: Student will receive no credit for the assignment, may be reported to the U of M Office for Student Conduct and Academic Integrity and may receive a “F” for the course.

**University of Minnesota, Twin Cities Campus Academic Policies, Fall 2018**

**Student Conduct Code**

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: [*http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student\_Conduct\_Code.pdf*](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf).

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

**Use of Personal Electronic Devices in the Classroom**

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference: [*http://policy.umn.edu/education/studentresp*](https://policy.umn.edu/education/studentresp).

**Scholastic Dishonesty**

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: [*http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student\_Conduct\_Code.pdf*](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf)) If it is determined that a student has cheated, the student may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see: [*http://policy.umn.edu/education/instructorresp*](https://policy.umn.edu/education/instructorresp).

The Office for Community Standards has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: [*https://communitystandards.umn.edu/avoid-violations/avoiding-scholastic-...*](https://communitystandards.umn.edu/avoid-violations/avoiding-scholastic-dishonesty). If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

**Makeup Work for Legitimate Absences**

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: [*http://policy.umn.edu/education/makeupwork*](https://policy.umn.edu/education/makeupwork).

**Appropriate Student Use of Class Notes and Course Materials**

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: [*http://policy.umn.edu/education/studentresp*](https://policy.umn.edu/education/studentresp).

**Grading and Transcripts**

The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following:

|  |  |
| --- | --- |
| A | 4.000 - Represents achievement that is outstanding relative to the level necessary to meet course requirements |
| A- | 3.667 |
| B+ | 3.333 |
| B | 3.000 - Represents achievement that is significantly above the level necessary to meet course requirements |
| B- | 2.667 |
| C+ | 2.333 |
| C | 2.000 - Represents achievement that meets the course requirements in every respect |
| C- | 1.667 |
| D+ | 1.333 |
| D | 1.000 - Represents achievement that is worthy of credit even though it fails to meet fully the course requirements |
| S | Represents achievement that is satisfactory, which is equivalent to a C- or better. |

For additional information, please refer to: [*http://policy.umn.edu/education/gradingtranscripts*](https://policy.umn.edu/education/gradingtranscripts).

**Sexual Harassment**

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: [*https://regents.umn.edu/sites/regents.umn.edu/files/policies/Sexual\_Harassment\_Sexual\_Assault\_Stalking\_Relationship\_Violence.pdf*](https://regents.umn.edu/sites/regents.umn.edu/files/policies/Sexual_Harassment_Sexual_Assault_Stalking_Relationship_Violence.pdf)

**Equity, Diversity, Equal Opportunity, and Affirmative Action**

The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: [*http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity\_Diversity\_EO\_AA.pdf*](http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf).

**Disability Accommodations**

The University of Minnesota views disability as an important aspect of diversity, and is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

* If you have, or think you have, a disability in any area such as, mental health, attention, learning, chronic health, sensory, or physical, please contact the DRC office on your campus (UM Twin Cities - *612.626.1333*) or CIS Associate Director, Jan Erickson (j-eric1@umn.edu or 612.624.9898), to arrange a confidential discussion regarding equitable access and reasonable accommodations.
* Students with short-term disabilities, such as a broken arm, **can** often work with instructors to **minimize** classroom barriers. In situations where additional assistance is needed, students should contact the DRC as noted above.
* If you are registered with the DRC and have a disability accommodation letter dated for this semester or this year, please contact your instructor early in the semester to review how the accommodations will be applied in the course.

Additional information is available on the DRC website: (UM Twin Cities - [*https://diversity.umn.edu/disability/*](https://diversity.umn.edu/disability/) ) or e-mail (UM Twin Cities - *drc@umn.edu*) with questions.

**Mental Health and Stress Management**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: [*http://www.mentalhealth.umn.edu*](http://www.mentalhealth.umn.edu/).

**Academic Freedom and Responsibility: *for courses that do not involve students in research***

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.\*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost. *[Customize with names and contact information as appropriate for the course/college/campus.]*

*\* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Fall 2018 Policies