CI 1806-002

College Algebra through Modeling

Susan Staats
332 Burton Hall
612 625-7820
staats@umn.edu
(email is the fastest way to contact me.)

Office Hours:
Mon & Wed 1 pm - 2 pm
and by appointment

Classroom:
Mon & Wed
Appleby Hall 226
11:15 – 12:30
ay15.moodle.umn.edu

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 will also use the spreadsheet program Excel extensively 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. Students investigate this aspect of mathematics through a modeling approach underlying the entire class. Modeling activities highlight issues such as educational equity, financial decision-making and analyzing the mathematics embedded in athletics and games. Models are drawn from disciplines of interest to CEHD majors. Throughout the modeling activities, students are asked to generalize their solutions and 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. Students may also earn credit through a service-learning option.
Prerequisites for CI 1806

The prerequisite for CI 1806 is three years high school math OR grade of at least C+ in PSTL 0731 or 0732 OR placement test score OR instructor consent.

Why a Liberal Education?

The goal of a liberal education is to give students skills and knowledge that they can use throughout life. Mathematics is fundamental part of a liberal education because it supports and enhances all subject areas. No matter what interests you, someone has collected data about the topic or has created mathematical equations that describe it. An elementary teacher teaches mathematics every day. An athletic manager uses data to decide on player’s positions and play time. A social scientist can change public policy by calling attention to data-oriented trends. The complexities of political and social life are often simplified through graphs and data, and so every citizen must develop opinions by reading and interpreting mathematical information.

The class is based on the principle that in order to become a lifelong user of mathematics, students must practice creating their own mathematical problems and then solving them. Mathematical creativity is emphasized in the extend section of each modeling assignment and in shorter assignments. Another aspect of developing lifelong mathematical skills is strengthening mathematical communication. Students practice using the language of mathematics precisely so that their methods can be shared with others, can be evaluated or improved by others, and can persuade others. In this class, students have the chance to use expressive skills like video making or creative writing to highlight mathematical situations and persuade people of their importance.

Key Assignments for a Liberal Education

Model 1: Calendar Game. This model will teach you the stages of a problem-solving process that we will use throughout the class. The stages of modeling that we will use are: simplify, represent, solve, interpret and extend. Through this assignment, students can connect math to personal interests by identifying and solving math questions in other games and sports.

Model 4: Epidemiology. This model is concerned with modeling the course of an epidemic. The initial stages of the epidemic involve a very small number of ill people, and a very low increase in cases. Still, even with these low levels of prevalence, the model shows how an epidemic can spread throughout a community. This assignment contributes to a liberal education by teaching students to create shareable mathematical solutions and by highlighting a deeper understanding of slopes and rates of change.

Mini Model: Counters Game. In this model, students play and model a probability game. The entire class develops a data set to highlight patterns in the game. This assignment contributes to a liberal mathematical education by demonstrating the presence of mathematical patterns within game
strategies, and it demonstrates that the development of mathematical ideas often depends on the effort of many people working on a problem together.

Model 5: Modeling Your World. This final model asks students to locate data about educational issues, or to create an innovative lesson plan for elementary mathematics. This model emphasizes the interpretation stage of modeling, so that students will explore the broader meaning of their project through interviews, academic research or creative writing. This assignment demonstrates to students that they can be lifelong users of mathematics, because they create nearly all the details of their submission.

Required Materials

- **Scientific calculator** (your choice, anything with buttons that say log, ln, 10^x). No cell phone calculators or iPad calculators can be used during tests.

- **Excel spreadsheet program.** This is loaded on most computers along with other MicroSoft applications like Word. If you do not have a personal computer, please schedule time each week in one of the University computer labs so that you can complete your homework.

- **Graph paper.**

- **The textbook for this class is a free, open-source textbook that is available on the class website.**

Optional Materials

Here are some additional resources that can support your learning during this class. They will not be used in class in any direct way.

- [www.abebooks.com](http://www.abebooks.com). You can get very inexpensive algebra textbooks on this website. A recommended textbook is: College Algebra in Context, by Harshbarger & Yocco, any edition. You can probably acquire this textbook for under $5 shipped.

- Algebra Bootcamp app, $5, is similar to a textbook.

- Khan Academy Algebra 1 and Algebra 2 apps, free.
Student Learning Outcomes (SLOs)

CI 1806 addresses the following SLOs as outlined at 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

- Do not use computers or mobile devices for activities unrelated to class. Checking email or web surfing in class may result in a 5 point reduction of your homework grade for each case.
- Electronic devices such as cell phones and music players must be turned off during class.
- Listen to your classmates carefully and give them useful but supportive feedback on their mathematical ideas.
- No cell phone or iPad calculators allowed during tests.

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.

Pace of Class

The class moves quickly. You should get most of your homework questions answered outside of class. We will have time to discuss only a few homework questions in class each day. Please find study partners, visit the instructor’s office hours for help, and use the SMART learning commons free tutoring service. http://smart.umn.edu/. One of the best tutoring options for this class is the Multicultural Center for Academic Excellence, Appleby 140, http://www.mcae.umn.edu. They will have walk-in tutoring in many subjects, including algebra, starting in the second week of school.
Late Assignments

There are no make-ups on tests except in cases of religious holidays, military service or University-sponsored events. If you must miss a test for one of these three reasons, please make arrangements at the beginning of the semester or as soon as you know about the absence. If you miss a test for a different reason, you cannot make-up the test. Your final exam score will be substituted for the missing grade.

Most weekends, there will be a practice quiz on the Moodle website. These quizzes cannot be made up once they close. The quizzes are open for several days, and you can take the quiz twice. It’s recommended that you complete the quiz well before the time it closes.

Homeworks, models and in-class assignments can be made-up in cases of serious problems with permission of the instructor. However, these assignments can be no more than 1 week late. If the assignment is submitted more than a week late, it will receive less than full credit.

Service Learning Option

Students have the option of arranging 2-3 hours per week (at least 20 total hours) of community volunteer work through the Career and Community Learning Center. If you choose this option, you will complete your final model, Modeling Your World, using data related to your service learning topic.

Students who choose the service learning option receive 50 extra credit points at the end of the semester once they have completed a minimum of 20 hours of community volunteer work. A student who completes fewer than 20 hours will have the extra credit reduced in points. For example, completing 10 hours will result in a service learning extra credit grade of 25 points.
PROS and CONS of doing Service Learning

<table>
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<tr>
<th>Pros</th>
<th>Cons</th>
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<tr>
<td>• Get additional 50 points extra credit</td>
<td>• You may spend more time on the 1006 class when you count volunteer hours compared to non-service learning students</td>
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<td>• Complete Final Model in relation to your service-learning topic</td>
<td>• Once you agree to work with an organization, it is a semester-long commitment</td>
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<td>• Career exploration</td>
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<td>• Serve the community</td>
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<td>• Connect math to your interests</td>
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Please see important details about the service-learning option later in this syllabus.

Grading
Course grades are based on 1000 total points. The points are distributed across assignments as follows:

Homeworks 100 points
There are 20 homework assignments

Moodle quizzes and in-class activities 100 points
Most Sundays, a Moodle quiz will be due. There will also be some graded in-class activities. Your goal is to amass 100 points in this category. You will have the chance to work on more than 100 points. Once you reach 100 points, you have reached the maximum.

Models 200 points
There are four major models: Calendars, Friendship and Fairness, Historic Hotels, and Epidemiology. For each of these four models, there is a 30 point group assignment, a 10 point Individual extend, and a 10 point Follow-up homework.

Model 5: Model Your World. 40 points
This is a final model that you
choose and develop yourself.

**Mini-Models**
There are three smaller and shorter 60 points Models that you will turn in as a group:
Hexagons, The Baseball Pythagorean Theorem and Counters’ game. 20 points each.

**Tests**
Two tests, 150 points each. 300 points

**Final Exam**
200 points

**Total** 1000 points

You can calculate your grade at any time using information on Moodle. Just find your total points, and find the total possible points at that moment in class, and calculate a percentage. The table on the next page lets you calculate your grade.

At the end of the class, if there are not exactly 1000 points, the grade will be assigned using the percent column below. Final grades are assigned according to University grading policy.

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<tr>
<th>Grade</th>
<th>Points</th>
<th>Minimum percent needed</th>
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<tr>
<td>A</td>
<td>950</td>
<td>95</td>
<td>4.00</td>
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<tr>
<td>A –</td>
<td>900</td>
<td>90</td>
<td>3.67</td>
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<tr>
<td>B +</td>
<td>870</td>
<td>87</td>
<td>3.33</td>
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<tr>
<td>B</td>
<td>830</td>
<td>83</td>
<td>3.00</td>
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<tr>
<td>B –</td>
<td>800</td>
<td>80</td>
<td>2.67</td>
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<td>C +</td>
<td>770</td>
<td>77</td>
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<td>C</td>
<td>730</td>
<td>73</td>
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<td>C –</td>
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<td>1.67</td>
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<td>D +</td>
<td>670</td>
<td>67</td>
<td>1.33</td>
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<td>D</td>
<td>650</td>
<td>65</td>
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Final Model: Modeling Your World assignment
This is a graded assignment that all students complete near the end of the semester. Service-learning students complete it in connection with their volunteer work. Service-learning students collect data about their service learning topic and analyze it using the methods that you learn in class, for example, graphing and creating equations using Excel, making predictions, and interpreting or explaining the significance of your data and predictions.

For example, your service learning experience might involve tutoring children in reading. For your test extra credit and your Modeling Your World assignment, you could collect and data about literacy rates among children of similar age. Using this approach, you will be able to use algebraic methods to deepen your service learning experience no matter what volunteer experience you choose.

Service-Learning Policies
(applies only to students who sign up for the service-learning option)

Academic integrity also applies to community work done for academic credit. Any of the following actions constitute academic dishonesty within a community-based learning context and will be addressed in the same way as any other act of academic dishonesty:

1. Misrepresenting hours completed at a community site or spent working on a community project (students can count time spent off-site doing work that is required to complete a project for a community organization).
2. Writing reflections or completing other assignments about events or activities the student was supposed to attend and participate in, but did not actually attend or participate in.
3. Signing in at a site or training session and leaving before the hours or training was completed OR signing in for a friend or classmate at a site.
4. Writing reflections based on previous community work or documenting hours done at a community organization during a previous semester and misrepresenting it as your current service-learning experience.

Accommodations for Students Registered with Disability Services Doing Service-Learning
If you are registered with Disability Resource Center you are eligible to receive accommodations from the University when doing service-learning in the community. While not all buildings where community groups are located are 100% accessible to students with physical disabilities, service-learning staff can
Confidentiality and Privacy Issues within the Service-Learning Context

Community organizations participating in service-learning expect students to work to the best of their abilities and act in a responsible manner. Furthermore, many service-learning students will be working with individuals who fall into protected categories, such as children, seniors, or individuals with disabilities. Be aware that through your service-learning, you may come to know information about individuals that is covered by rules and ethical guidelines about confidentiality. You should speak to your community supervisor about how confidentiality obligations apply to you. Examples of how these issues might arise in your service-learning include:

1. You should not take photographs of anyone at your service-learning site without following the policy the organization has in place. This often involves getting written permission from the individual and/or written permission or the parent/guardian of children under 18 years of age.
2. During class discussions, be careful about revealing any information that could be used to personally identify any individual you work with in your service-learning.
3. In written assignments and especially when using online learning tools (Moodle, class blogs, etc.), be particularly attentive about the information you disclose about your service-learning experience, in case the site you are using is publicly available online. Refrain from mentioning the name of your organization and change the names of any individuals you write about if you are utilizing these online tools for your class.

Please note that Criminal Background Checks are also required for many service-learning placements, especially those that involve working with “vulnerable populations” such as children, the elderly, and individuals with disabilities. If the agency asks about any convictions and you have a criminal record:
• Be honest. Failure to state convictions that are then uncovered in a background check will likely result in your immediate dismissal from your service organization.
• Ask the agency representative to explain what types of convictions are not acceptable (these often involve convictions such as those involving theft, violence, drug sales, and/or crimes against minors).
• If you believe that your record could disqualify you from the approved service-learning options, please be proactive and talk to your service-learning liaison to discuss alternative placement options.

Non-Discrimination and Religious Service
According to the University of Minnesota Board of Regents policy on *Equity, Diversity, Equal Opportunity and Affirmative Action*, the University shall,

> Provide equal access to and opportunity in its programs, facilities, and employment 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.

This policy applies to service-learning provided as part of any academic course, so the Community Service-Learning Center (CSLC) shall only develop partnerships with organizations that comply with this policy and offer volunteer opportunities to any and all interested students. **If your faculty member allows you to do your service-learning at an organization that is not a CSLC partner, CSLC staff must contact the organization to ensure their compliance with this non-discrimination policy before your work with them will be approved for class credit.** Organizations that exclude any potential volunteers on the basis of any of the criteria listed in the non-discrimination policy will not be a permissible service-learning site. In order for you to receive academic credit, the site must qualify as a “University of Minnesota program” that is equally available to all members of our community.

You may perform service-learning with faith-based organizations, including religious institutions such as churches, mosques, synagogues, temples, etc., if the organization complies with the non-discrimination policy. However, service done as part of an academic course **cannot include any of the following religious activities: providing religious education/instruction, conducting worship services, or engaging in any form of religious proselytizing.** CSLC staff ensures that our community partner organizations comply with these guidelines as well. Again, if your faculty member allows you to do your service-learning at an organization that is not a CSLC partner and you would like to work with a faith-based organization or a religious institution, **please consult with your service-learning coordinator before beginning your service to make sure your proposed experience adheres to these guidelines.**

**ADDITIONAL INFORMATION ON SERVICE-LEARNING**

**What is service-learning?**
Service-learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities. Students use what they learn in the classroom to address community-identified issues. They not only learn about practical applications of their studies, they also become actively contributing citizens and community members through the service they perform.

**What does service-learning look like at the University of Minnesota?**
Students either work individually or in small groups with a community-based organization to address a community need;

- Students work with one organization over the course of the semester, either in a direct service role or on a specific project tied to the content of their academic course;
- The experience is relationship-based;
- Students’ work with the organization will be ongoing throughout the semester, averaging 2-3 hours per week for approximately 30 hours (a minimum of 20 hours total is required).

Why participate in service-learning?
Many people learn as well or better by doing as by reading or listening. Education is a function not only of lectures and books, but also of experience, and especially of connecting what one reads and hears with ongoing experiences and observation. Service-learning provides a hands-on approach to learning while also contributing the public good.

Why am I getting credit for volunteering?
Attendance and participation in class sessions may form part of your final grade for a class, but typically most of your grade comes from other assignments that allow you to demonstrate what you have learned from lectures, readings, discussions, etc. Service-learning works the same way – your instructor may determine part of your course grade by the time you spend working with an organization, but more significantly, you are receiving credit for the learning connected to your experience in the community. This makes service-learning different from volunteering, where the primary emphasis is on the service being provided and the primary intended beneficiary is clearly the service recipient. The learning in service-learning is equally important, and it primarily benefits you, the learner. Think of your service-learning experience as a text you are learning from, but instead of reading it, you are living it. Unless you are able to articulate and connect what you learn from your course texts, from lectures, and from your experience in the community to the course concepts to your instructor in an acceptable way, you will not get credit for your work.

What doesn’t count for service-learning?
Here are some examples of when volunteer or community work may not be used to fulfill a service-learning requirement for a course. If you have any questions about what does or doesn’t count, contact your faculty member and your service-learning coordinator.

- **On-Campus Service:** An important component of service-learning is the opportunity to engage with communities outside of campus and learn from new and different environments, so work done with and for a student organization or campus office or program, even if it is unpaid, will not fulfill service-learning requirements. There are some on-campus experiences that can count as service-learning if the work includes partnering with off-campus communities or individuals.
- **Work Study or Paid Work:** The spirit of service-learning is that it is unpaid work that benefits the community and enhances student learning. This is also a matter of fairness: while many students work, most students are not able to apply their paid work experiences to fulfilling service-learning requirements.
· **Working with immediate family**: Service-learning activities must adhere to all University policies. This includes the policy on Managing Nepotism and Personal Relationships, which prohibits individuals from teaching or supervising the employment of any member of their family or their partner. Since you are doing service-learning as part of an academic course, it would likewise be inappropriate for a member of your family or a significant other to serve as your service-learning supervisor.

**Does the time I spend traveling to and from my service-learning site count toward my required hours?**
No, just as time spent traveling to and from class does not count as instructional time, and time spent traveling to and from a job is not compensated. When you schedule service-learning into your weekly activities, you need to allow enough time to get to and from your organization, but you should only record the hours you spend working at the organization.

**Can I be reimbursed for the costs of traveling to my service-learning site, like my bus fare?**
No. Service-learning provides additional content for your class, just like any books you are required to purchase. Think of your transportation costs for service-learning as if you were assigned to purchase another book for the class instead.

**What if I’m doing service-learning in multiple courses this semester?**
Most students in this situation want to know, “can I use the same placement for both courses?” The answer is often yes, as long as the work you’ll be doing at your service-learning site has a clear connection to the course content for both classes. If you are in this situation, **contact your service-learning coordinator as soon as possible** and copy your instructors on the message to begin the process of making sure your organization is approved for both classes and discussing how many total hours of service-learning will be expected of you during the semester (students in this situation are asked to do more than the minimum number of hours required for one class). **You should only record the hours you spend at the organization once in the online system**, and your service-learning coordinator will also make sure that both of your instructors know how many hours you have completed by the end of the semester. If one of these courses is an internship, field experience or required for a professional license, it is unlikely you will be able to reduce your total hours and/or combine placements.

**Should I record the hours I spent at my pre-service training workshop?**
You should record any time spent attending orientation and/or training sessions at your organization, but **do not record the hours you spend attending a pre-service training workshop offered on campus by the Community Service-Learning Center** (Community Involvement in Practice, Critical Perspectives on Community Involvement, or the MLC Tutor Training), **even if your instructor is allowing you to count your workshop attendance toward your total hours for the semester**. All hours you record in the online system are submitted to your organization for your supervisor’s approval, and s/he has no way of knowing whether or not you attended a training on campus. Your attendance at the pre-service training will be tracked in another part of the online system so your instructor can give you the appropriate credit.
UNIVERSITY POLICIES

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:
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:

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) If it is determined that a student has cheated, he or she 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/Policies/Education/Education/INSTRUCTORRESP.html.
The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to 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/Policies/Education/Education/MAKEUPWORK.html](http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html).

**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/Policies/Education/Education/STUDENTRESP.html](http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html).

**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/Policies/Education/Education/GRADINGTRANSCRIPTS.html](http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html).
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: http://regents.umn.edu/sites/default/files/policies/SexHarassment.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/default/files/policies/Equity_Diversity_EO_AA.pdf

Disability Accommodations:
The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.
If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.
If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.
For more information, please see the DS website, https://diversity.umn.edu/disability/.

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.

Complaints Regarding Teaching/Grading:
Students with complaints about teaching or grading should first try to resolve the problem with the instructor involved. If no satisfactory resolution can be reached, students may then discuss the matter with the Department Chair, 206 Burton Hall, 626-8705, who will attempt to mediate. Failing an informal resolution, the staff in the PsTL departmental office will facilitate the filing of a formal complaint.
Complaints Regarding Advising:
Students with complaints about advising should first try to resolve the problem with the advisor involved. If no satisfactory resolution can be reached, students take the matter to CEHD Student Professional Services, 360 Education Sciences Building, 625-3339, who will attempt to mediate. Failing an informal resolution, the CEHD Student Services staff will facilitate the filing of a formal complaint.

**Academic Freedom and Responsibility**
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.

* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".
CI 1806: College Algebra through Modeling
Tentative Schedule

Changes to the schedule will be announced in class and on the Moodle website. This will include changes to the topics of the weekend Moodle quizzes, and occasional extensions of due dates.

**Week 1: Wed, Jan 20**
On Wednesday, our first day of class, we will introduce our first modeling activity, the Calendar Game. You'll begin to learn the five stages of math modeling: Simplify, Represent, Solve, Interpret and Extend. Over the weekend, work on improving your Calendar Game method. Bring a sheet of paper with your best idea so far on Monday, Jan 25.

You have a good Calendar Game method if
1) You don't need to look at a calendar to solve the game.
2) You can teach your method fully to another person.
3) Your method works on all calendar months.
4) It's easy and pretty quick.

There's nothing due Monday of Week 2. However, over the weekend, skim the textbook.
We will practice some problems like these in class next week.

Skim pp. 32 - 38 on Exponent Laws. Optional: Try practice problems on p. 52, # 73 - 82; 93 - 103. Don't turn them in.
We will practice some problems like these in class next week.

**Week 2: Mon, Jan 25 and Wed, Jan 27**
This week, we'll begin studying slopes and graphs of linear functions. We'll discuss problems for HW 1 and HW 2 in class. We will check in on your ideas for the Calendar Game model each day to be sure everyone is improving their methods. You don't have to turn in the Calendar Game Model this week, but by the end of this week, you should have developed a good method for solving the Calendar Game, you should have chosen an Extend problem to work on, and you should begin writing up the assignment. We'll also have our first weekend online quiz this week, on Order of Operations and Exponent Laws.
Monica McKay of the Center for Service-Learning will visit our class on Wednesday this week to discuss the service-learning option—a way to earn extra credit in the class through doing 20 hours of volunteer work. Decide on the service-learning option by Friday, Jan 29, Start at www.csl.umn.edu.

More about Week 2: Mon, Jan 25 and Wed, Jan 27

Due this week:

· Monday, Jan 25: Nothing is due
· Wednesday, Jan 27, HW 1 is due.
· By Sunday, Jan 31, at 10 pm:

Complete the online quiz on Order of Operations and Exponent Laws. The quiz is open notes, open book, and you can work together with friends. You get two tries. Once you start the quiz, you have 2 hours to complete it. In other words, the quiz is designed for you to do well, and it encourages you to talk to other students about the math problems.

Assigned this week:

Homework 1: Section 4.1. Starts on page 430. 1, 2, 14 -16, 20 - 22, 24 - 26, 42, 44, 45, 72, 73. Due Wed, Jan 27. Show more work than the answer key, or write a sentence of explanation, in order to get full credit. For solutions, see p. 77 of the solution manual; many of the assigned problems are answered there.


On all the homework assignments, you can use the problems near the assigned problems as extra practice if you want (not to be turned in, though).

Week 3: Mon, Feb 1 and Wed, Feb 3

On Monday, Feb. 1, we will begin working on a mini model on Hexagons. You will turn in one model per group on Mon, Feb 8. We will also begin working on problems from section 4.2 in the textbook.

On Wednesday, Feb. 3, we will finish our study of linear functions from section 4.2.
Due this week:

- On Monday, Feb. 1, HW 2 is due.
- On Wednesday, Feb 3, Model 1: Calendar Game is due.
- By Sunday, Feb. 7, complete online quiz. This quiz will cover slopes, intercepts and other material on linear functions that we've covered in class.

Assigned this week:


Week 4: Mon, Feb 8 and Wed, Feb 10

On Monday, we will learn to use the spreadsheet program Excel to graph equations. If it is possible, please bring your laptop to class on Monday. We can work in groups so that people without laptops can practice the assignment on Excel, which is Homework 4.

By Wednesday, Feb. 10, we will start Model 2 on Friendship and Fairness. HW 4 on Excel is due today--you will upload your spreadsheet into a Moodle dropbox, which you will find below.

Over the weekend, you should complete Homework 5: Library of Functions. Your goal is to learn the graphical shape of a wide variety of equations. You can do this using Excel, Desmos, or graphing by hand. However you find the graphs, just sketch them by hand and turn them in as a homework paper.

Due this week:

- On Monday, Feb. 8, Group Model on Hexagons is due. HW 3 is due.
- On Wednesday, Feb. 10, HW 4 on Excel is due--upload to the Moodle website.
- By Sunday, Feb 14, 10 pm. Complete online quiz on equations of linear functions.

Assigned this week:
Homework 4 on graphing with Excel (on Moodle website).
Homework 5 on Library of Functions (on Moodle website).

Week 5: Mon, Feb 15 and Wed, Feb 17
On Monday, we'll begin working on factoring, p. 87 in the textbook.
On Wednesday, Feb. 17, we'll begin working on concavity.

Due this week:
On Monday, Feb 15, HW 5: Library of Functions is due.
On Wednesday, Feb 17, day, HW 6: Factoring is due.
On Sunday, Feb. 21, complete the moodle quiz on factoring, library of functions and other recent assignments.

Assigned this week:

Homework 7 on Concavity (on Moodle website)

Week 6: Mon, Feb 22 and Wed, Feb 24
On Monday, we'll begin a new mini model on the Baseball Pythagorean Theorem, which is due Mon, Mar 7. HW 7 on Concavity is due. Model 2 on Friendship and Fairness is due. We will also review for Test 1.
On Wednesday, we'll have Test 1. There will be an in-class portion and a take-home portion that tests your knowledge of Excel. Test 1 covers HW 1 to 7, Model 1, mini model on hexagons, all online quizzes, and any in-class activities.

Due this week:

• On Monday, Feb 22, Model 2 and HW 7 are due.
• On Wednesday, Feb. 24, we will have Test 1.
• Sunday quiz will be announced in class.
**Week 7: Mon, Feb 29 and Wed, Mar 2**

On Monday, we will work on Transformations of Functions, section 3.5 in the textbook. On Wednesday, we will work on graphing quadratic functions, section 5.1 in the textbook.

Everyone should begin thinking about what math project they want to do for Model 5: Modeling Your World. The proposal is due Mar. 21 (the first day back from spring break) and the final project is due Monday, Apr. 18.

**Due this week:**
- Nothing is due on Monday.
- On Wednesday, Mar 2, HW 8 is due.
- By Sun, Mar 6, complete quiz. It covers the transformations of functions and other recent assignments.

**Assigned this week:**

**Homework 8.** Section 3.5. Starts on page 348. 304, 306, 308, 314, 322, 324, 326, 328, 330, 332, 334, 368, 370. For solutions, see p. 60 of solution manual.

**Homework 9.** Section 5.1. Starts on p. 495. 15, 17, 19, 26, 28, 34, 36, 39, 40, 42, 44, 70, 72. For solutions, see p. 95 of solution manual.

**Week 8: Mon, Mar 7 and Wed, Mar 9**

We'll introduce a model, Model 3 on Hotels, which will be due after spring break on Wed, Mar 23.

On Monday, Mar. 7, we will spend most of the time on the new Hotels model. HW 9 and Mini Model 2 on Baseball is due.

On Wednesday, Mar. 9, we will work on solving quadratic functions, section 2.5 in the textbook.

**Spring Break is next week!**

No class Mon, Mar 14 to Fri, Mar. 18!

No online quiz on Sunday, Mar 13 or Sunday, Mar 20 during Spring Break!

**Due this week:**
On Mon, Mar. 7, HW 9 on graphing quadratics and group model on Baseball are due.

**Assign this week:**
**Homework 10.** Section 2.5. Starts on p. 186. 240, 242, 248, 256, 284, 288. For solutions, see p. 30 of solution manual.

**Week 9: Mon, Mar 21 and Wed, Mar 23**
On Monday, Mar 21, we will begin HW 11 on Rational Functions.

On Wednesday, Mar 23, we will begin HW 12 on Exponentials and HW 13 on Logarithmic Functions and Graphs.

**Due this week:**
- On Monday, Mar 21, HW 10 and the Modeling Your World proposal are due.
- On Wednesday, Mar 23, HW 11, HW 12 and Model 3 on Hotels are due.
- On Sunday, Mar 27, 10 pm. Complete moodle quiz on quadratic functions.

**Assign this week:**
**Homework 12.** Section 6.2. Starts on p. 681. 81, 83, 85, 87, 89, 95. For solutions, see p. 134 of solution manual.

**Week 10: Mon, Mar 28 and Wed, Mar 30**
On Monday, we'll work on properties of logarithms and logarithm equations. We will also start a new individual model, Model 4: Epidemiology.

On Wednesday, we'll work more on logarithms.

**Due this week:**
- On Mon, Mar 28, HW 12 is due, and on Wed, Mar 30, HW 13 is due.
Everyone should be working on their Model 5: Modeling Your World assignment.
By Sun, Apr 3, complete online check-in quiz on recent class topics.

Assigned this week:


Week 11: Mon, Apr 4 and Wed, Apr 6
On Monday, we will have an in-class activity on logarithms and we will review for Test 2. Test 2 covers HW 8 to 14, Models and Mini Models, online quizzes and class activities.

Due this week:
· On Monday, Apr 4, HW 14 is due.
· On Wednesday, Apr 5, we will have Test 2
· By Sunday, Apr 10 at 10 pm, complete Moodle quiz.

Week 12: Mon, Apr 11 and Wed, Apr 13
On Monday, we'll begin a group model, the Counter's Game. On Wednesday, we will begin our study of principles of counting.

Due this week:
· On Monday, Apr 11, Model 4 is due.
· On Wednesday, nothing is due!
· By Sun, Apr 17, at 10 pm, complete Moodle quiz

Assigned this week:
Homework 15: Introduction to Counting (on Moodle website)
**Week 13: Mon, Apr 18 and Wed, Apr 20**

On Monday, we'll begin a group model, the Counter’s Game. On Wednesday, we will begin our study of principles of counting.

**Due this week:**

- On Monday, Apr 11, HW 15 is due
- On Wednesday, nothing is due!
- By Sun, Apr 24, at 10 pm, complete Moodle quiz

**Assigned this week:**

**Homework 16:** Combinations and Permutations (on Moodle website)

**Week 14: Mon, Apr 25 and Wed, Apr 27**

This week, we'll work on basic probability concepts and on conditional probability.

**Due this week:**

- On Monday, Apr 25, HW 16 is due.
- On Wednesday, Apr 27, HW 17 is due.

**Assigned this week:**

**Homework 17:** Probability (on Moodle website)
**Homework 18:** Conditional Probability and Mutually Exclusive Events (on Moodle website)

**Week 15: Mon, May 2 and Wed, May 4**

On Monday, we will cover binomial probability, the last topic of the class! On Wednesday, we will review for the Final Exam. Homework 20 is a review for the final and will be handed out in class.

**The Final Exam will be on Mon, May 9, 10:30-12:30. Location will be assigned.**

**Due this week:**

- Monday, May 2, HW 18 is due
- Wednesday, May 4, HW 19 and HW 20 are due.