# Math 1010 -06 Intermediate Algebra (4 cr)

## *Fall 2017* Syllabus

**Instructor: Aurora Jensen**
**Class meetings: MTTh, 4:35-5:55, JFB 103**
**Office Hours: Wednesdays 2:30-3:30, MTTH 5:55-6:20**
**Office Location: JWB 121 and JFB 103**
**E-mail address: ajensen@math.utah.edu**
**Website: Canvas**
**Learning Assistants:** Katie Kume, Owen Lareaux
**Required Materials:**

- Turning Technologies QT Response Card, also known as a "clicker", and an active license to use it. (Note: the license is on a small piece of paper boxed with the clicker. Keep this paper. Follow directions on Canvas to register your clicker and license. Clicker points start counting towards your grade in Week 2.)

- Math 1010 Course Packet, *Fall 2017, A Workbook for Math 1010, A Functional Approach to Intermediate Algebra*, available for download from Canvas of for purchase at Fed-Ex (corner of 200 South and University Street)

- Consult with your instructor on a topic-by-topic basis for additional online resources.

**Dates:**

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|---|---|---|---|---|
| Mon 8/21 | First Day of Class | | Thurs 9/14 | Midterm Exam 1 |
| Fri 8/25 | Last Day to Add without Permission | | Thurs 10/19 | Midterm Exam 2 |
| Fri 9/1 | Last Day to Drop/Add | | Thurs 11/16 | Midterm Exam 3 |
| Mon 9/4 | Labor Day | | Tues 12/12 | Common Final Exam |
| 10/9 - 10/13 | Fall Break | | | |
| Fri 10/20 | Last Day to Audit/Withdraw | | | |
| 11/23 - 11/24 | Thanksgiving Break | | | |
| Thur 12/7 | Last Day of Semester | | | |

**Course Description:** Mathematics is a sense making activity to understand the world we live in. Scientists, social scientists, engineers, business leaders, health care providers, and politicians require a high degree of quantitative literacy to accomplish their goals. In this course, students will become adept at working with linear, exponential, basic logarithmic, quadratic, square root, and power functions, and see how these functions can be used to describe and analyze some of the most difficult problems our society faces. Along the way, functions are used to motivate important topics including evaluating expressions, solving equations and inequalities, graphing, and analyzing graphs.

**Prerequisites:** "C" or better in MATH 990 OR Accuplacer EA score of 54 or better OR ACT Math score of 18 or better OR SAT Math score of 470 or better.

**Expected Learning Outcomes:**

Upon successful completion of this course, a student should be able to:

1. Work with functions presented in tables, graphs, with algebraic expression, or in words. Determine if relations presented in any of these formats are functions.

2. Find the domain, x-intercepts, y-intercepts, output given the input, and input given the output for all functions presented with tables, graphs, or algebra. Find the range of functions presented graphically.

3. Decide if a given function is linear, quadratic, exponential, or none of the above for functions presented algebraically, graphically, or in tables.

4. Know the shapes of the graphs of all the above functions. Be able to recognize when a sufficient portion of the graph is sketched in order to indicate the graph shape.

5. Graphing Techniques Vary by Function

    (a) Graph linear functions using either two points or one point and a slope.
    (b) Graph quadratic functions using both these approaches
        i. the x-intercepts and the vertex (or line of symmetry)
        ii. the vertex and an efficient table (be able to use symmetry and possibly the y-intercept)
    (c) Graph logarithmic functions with no transformations by switching the x- and y-values of the corresponding exponential graph.
    (d) Graph exponential and square root functions, when given in transformation form, using efficient tables.
    (e) Graph power functions with no transformations using tables.

6. Solve linear, quadratic, exponential, logarithmic and square root equations.

    (a) Solve quadratic equations using the zero-product property, completing the square, and the quadratic formula.

7. Solve linear inequalities and give answers in inequality, interval, and graphical (number line) format.

8. Determine the slope of a line; find the equations of lines given information about them. Decide if lines are parallel, perpendicular, or neither.

9. Solve 2x2 systems of linear equations and functions using graphical and substitution methods.

10. Be able to factor quadratic expressions or decide if they cannot be factored; complete the square.

11. Perform composition of functions presented with tables, graphs, or algebra.

12. Decide if a function presented with a table or graph is invertible and give the inverse in the same format.

13. Find the algebraic inverse of a linear function presented algebraically.

14. Make sense of exponent rules, negative exponents, and rational exponents. Use exponent rules to simplify exponential expressions.

15. Construct algebraic models to describe real life situations. Be able to decide what type of model fits a situation best:

    (a) Use linear functions to model constant rates of growth.
    (b) Use exponential functions to model constant percent change.
    (c) Use quadratic functions to model constant acceleration.

16. Analyze and use linear, exponential, and quadratic models to answer questions about the situations they represent. In particular, relate graphical features (like the x- and y-intercepts and the vertex or a parabola) to specific aspects of the situation being modeled. For quadratics, be able to rewrite the function appropriately in order to find the information desired.

**Teaching and Learning Methods:**

- **In class:** We will be working through the course packet in class. You can expect to:

  - Work with your partner(s) on the problems in class,
  - Have whole class discussions and short lectures on pertinent material,
  - Engage in problem solving during class. During these sessions you will work together in groups of two or three. The instructor and learning assistants will be available during each session to help you as necessary. On occasion you may be asked to turn in your work.
  - Think about and work on material ahead of time (this will often be assessed with clicker questions),
  - Respond individually or as part of a group to clicker questions. These questions will be frequently used to check in class comprehension and to lead the discussions.

  These activities are organized for your benefit. Work in class is meant to train you to become better problem solvers, inform you of how well you are understanding the material, and to inform me what we need to focus on. You are required to be in class and engage actively to maximize the benefits of class work. If you prefer to work in your own time, we recommend taking an on-line class that allows this flexibility.

- **In labs:** In addition to coming to class everyday, you are expected to attend the lab you registered for. Labs are conducted by the learning assistant(s) and during the lab sessions, you will work in small groups on problems that are given to you in the lab. There will be time for discussion of the lab material and feedback. At the end of every the lab period, you will turn in every problem set along with the names of your group members, even if you don't finish. You must attend a lab to turn in a lab-sheet and you can not turn in the lab-sheet late. Blank lab sheets and solutions will be posted at the end of the week so that you can keep working on the assignments for your own benefit (not for a grade). It is highly recommended that you finish each assignment.

- **Homework**: Working through problems and getting feedback on whether your process and calculations are correct is an important part of understanding material. WeBWorK is an online homework website that gives you instant feedback on your work, and allows you as many tries as you need to complete the problems. We will also answer question you have about the homework in class. There will be two to five assignments every week with due dates announced in class. An invitation to WeBWorK will be sent to your Umail address on the first day of class or within two business days if you add the class after that. Make sure to check your Umail regularly or have it forwarded.

- **In-Class Quizzes**: Short quizzes will be given weekly. These quizzes will be based on the course packet content, webwork, and labs. If you have questions about concepts/problems in any of these, ask about them! The quizzes provide feedback on your understanding of the course material and ability to explain this understanding. Use this feedback to prepare for exams. The lowest quiz score will be dropped.

**Additional Scoring Information for the Above Activities:**

- **Clicker Questions**: Scoring is as follows: A total of 4 points will be awarded for a correct answer. A total of 3 points will be awarded for an incorrect answer. A total of zero points will be awarded if no answer at all is entered. Therefore, it is in your best interest to try to answer each question correctly, but enter your best guess regardless. At the end of the semester, those students who have accumulated 85% of the total clicker points will get the maximum points added to their overall score at the end of the semester. Those falling below the 85% threshold will receive a proportional amount of the maximum points.

- **Lab Worksheets:** Scoring is as follows: 5 points for making a reasonable effort and being mostly correct, 3 points for a reasonable effort, 1 point for making a really weak effort, and zero points for not attending/turning in the worksheet. The lowest lab score will be dropped at the end of the semester.

- **WeBWorK:** You will receive credit for each problem you submit. There is no submit button at the end of each assignment...all you do an answer problem by problem. Note that WeBWork grades do not automatically transfer to Canvas. Your instructor will transfer the grades every few weeks.

**Midterm Exams:** There are three in-class midterms. See the dates above.

**Final Exam:** The final exam for this class is comprehensive The date is above and the location will be announced. This is a departmental final, which means all students in all on-campus Math 1010 classes take it at the same, instead of during the slot that is assigned based on class meeting time. You are required to take it at this time, unless you have multiple finals scheduled for the same time slot. If this applies to you, inform your instructor by the deadline given in class. (Tardy notification of your instructor may result in a penalty on your exam). For all other students, make school/work/family arrangements at the start of the semester to be able to take the common final.

**Absences:** Make-ups for documented absences that are required as part of a University of Utah obligation (e.g athletes participating in an event, participating in a debate contest, etc.) will be granted. For all make-ups of this type, timely notification prior to the event is required.

For other absences, documentation of a reason beyond your control must be provided and make-ups will be granted only in the most extreme cases and at the sole discretion of the instructor.

If you miss a lab for a documentable reason beyond your control, provide your INSTRUCTOR (not your lab leader) with documentation. They will excuse the grade for that week in your lab. If you miss a lab for a reason within your control or that is not documentable, then you will get a 0 for the lab.

**Course Grade Components:** Semester grades will be calculated as follows:

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|---|---|---|
| Preparation for class / in-class work | 8% | Daily |
| Labs | 10 % | Weekly |
| Quizzes | 10% | Usually Friday |
| Homework (WeBWorK) | 7% | Weekly |
| Midterms | 35% | Three total |
| Final Exam | 30% | **You have to take the final to pass the course!** |

**Grading Scale:** The grading scale is: A (93,100], A- [90,93), B+ [87,89), B [83,87), B- [80,83), C+ [77,80), C [72,77), C- [69,72), D+ [66,69), D [60,66), D- [50,60), E [0,50). If I do need to curve the grades, I will do so on individual assignments or exams, not on the course grade a the end of the semester.

**Additional support:** This course is designed to challenge students. You may require additional support:

- Come to my office hours. This time is scheduled for you to come and ask questions on any of the material covered in class/homework/exams or any mathematical inquiry you may have.

- The math department offers free drop-in tutoring for students enrolled in this class. The center is located underneath the walkway between LCB and JWB and can be accessed by entering either building. They are open Monday - Thursday 8 AM - 8 PM and Friday 8 AM - 6 PM.

- A list of private tutors is available from the Math Department office.

**Accommodations:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 581-5020 (V/TDD). CDA will work with you and the instructor to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.

**Faculty and Student Responsibilities:**

1. It is your responsibility to be ready for class. This means you will have your clicker and the course packet with you at all times. No make ups will be allowed and no written responses to clicker questions will be accepted.

2. You will receive regular communication from me in Canvas about the assignments and other information. I expect you will read those in a timely manner. (If you do not check Canvas mail regularly, forward it to an address you do check often). I am happy to respond to any questions you have, but check my previous communication to make sure they were not answered already. All correspondence should be considered a formal means of communication. Please be thoughtful of your tone, grammar, and sentence structure.

3. The lowest of your quiz scores will be dropped which means you can miss one. Otherwise, no quizzes can be made up.

4. You may take an alternate midterm exam if you talk to me about it before the exam occurs and document the extenuating circumstances that make it necessary. Talking to me after the exam occurs is too late and you will get a 0 on the exam.

5. If you miss an assignment or exam due to an unforeseeable emergency, contact me as soon as possible with documentation of what happened. Depending on the situation, this assignment/exam may be waived.

6. In an effort to create a vibrant learning community, extraneous use of cell phones and other electronic devices is not allowed. Turn them off and put them away. Use of electronic devices distracts you, those around you, and me. If you are using a computer to take notes, it must lie flat on the desk. (No computers with open screens). If you need to use your phone during class, please leave the classroom. You will be asked to leave if your phone is visible.

7. You will be allowed to use a scientific calculator on all exams. A graphing calculator will not be allowed on exams. You are not allowed to use a cell phone for its calculator in class or on exams.

8. If you have questions about any exam/quiz/homework grade, or you want to appeal the grading of the exam/quiz/homework, you must bring it to me within one week of the return of the exam/quiz/homework. I'm happy to look over your appeal and/or questions and give my feedback in order to benefit your learning.

9. If you cheat on any lab, quiz or exam, you will automatically get a zero for that grade. Depending on the severity of the cheating, I may decide to fail you from the class. Also, if you exhibit any other behaviors that are unethical, like offering me a bribe to give you a better grade (even if you later claim you were joking), I will report your behavior to the Dean of Students.

10. The syllabus is not a legally binding contract. As the instructor, I reserve the right to change any portion of the syllabus provided you are given enough notice.