

# Math 1010-090 Intermediate Algebra (4 cr)

## Spring 2021 Syllabus

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**Instructor:** Dr. Predrag Krtolica

**Online Office Hours:** M 10:40-11:30 am & H 5:00-5:50 pm

**Office Location:** JWB 121

**E-mail address:** krtolica@math.utah.edu

**Website:** Canvas

### Required Materials:

- **Textbook** Miller/O'Neill/Hyde: Intermediate Algebra, 5th Ed. (McGraw-Hill) - ALEKS 360 (electronic version found in ALEKS).
- **Access to ALEKS** (Assessment and LEarning in Knowledge Spaces). You will be instructed on how to access it in canvas, once canvas is up and running.
- **Scientific Calculator** Important: graphing or phone calculators are not allowed!

### Electronic or Equipment Failure and Online Submissions:

- It is your responsibility to maintain your computer and related equipment in order to participate in the online portion of the course.
- Equipment failures will not be an acceptable excuse for late or absent assignments.
- You are responsible for submitting the assignment with the required naming convention, correct file extension, and using the software type and version required for the assignment.

### Dates:

T 1/19	First Day of Class	M 3/1 @ 5 pm	Exam 1
F 1/22	Last Day to Add without Permission	M 4/12 @ 5 pm	Exam 2
F 1/29	Last Day to Drop/Add/Audit		
M 2/15	Presidents' Day		
3/5	Non-Instructional Day		
3/7-3/14	Spring Break <u>Canceled</u>		
F 3/12	Last Day to Withdraw		
M 4/5	Non-Instructional Day		
T 4/27	Last Day of Semester	M 5/3 @ 3:30 pm	Final Exam

**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.

**After Math 1010:** Math 1010 is designed to prepare students who are entering STEM, business, and education fields for their future math classes. Math 1010 is also a prerequisite for such courses. The following grades in Math 1010 are needed to proceed:

- C in Math 1010 for Math 1050 (College Algebra) or Math 1090 (Business Algebra)
- B- in Math 1010 for Math 4010 (Mathematics for Elementary School Teachers I)
- B in Math 1010 for Math 1080 (Precalculus which is an accelerated College Algebra-Trig course)

Note, Math 1010 is not THE prerequisite. You can also enter the above courses with certain ACT or Accuplacer scores or other class scores. Use this link for information about prerequisites: [http://catalog.utah.edu/preview\\_entity.php?catoid=14&ent\\_oid=1782&returnto=1554](http://catalog.utah.edu/preview_entity.php?catoid=14&ent_oid=1782&returnto=1554).

If you are in a major with no math requirement other than the university's QA requirement, then MATH 1030 (Introduction to Quantitative Reasoning), is likely the best math class for you. Note, the prerequisite cut-offs for Math 1010 and Math 1030 are close to each other: an ACT score of 18 gets you into Math 1010; an ACT score of 19 gets you into Math 1030. If you were able to register for Math 1010 based on your ACT score but want to be in Math 1030, consider taking the Accuplacer placement exam, and trying to test into Math 1030 using your Accuplacer score (the Accuplacer placement exam is used by and given at the University of Utah.) You can find information about it here: <http://testingcenter.utah.edu/students/placement-tests/newstudents.php>. Also, todayourbestontheAccuplacer, douse thereviewmaterial (alsoavailablefromthelink).

If you are intending to take Math 1030 (Intro to Quantitative Reasoning) or Math 1040 (Intro to Statistics and Probability), and would like to use a course as your prerequisite, it is suggested that you take Math 980 instead of Math 1010. While Math 1010 is a prerequisite for these classes, it also covers many topics that will not be used in Math 1030 or Math 1040.

If you have any questions about which math class to take, you should check with your advisor or meet with a math department advisor. The math department advisors are there for all students at the university who have questions about math classes, not just math majors. You can find information about them at <http://www.math.utah.edu/ugrad/advising.php>.

### 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 expressions, or in words. Determine if relations presented in any of these formats are functions. The functions covered in this course are linear, exponential, logarithmic, quadratic, square root, power, and  $n$ th-root.
2. Find the domain,  $x$ -intercepts,  $y$ -intercepts, output given input, and input given output for all functions presented with tables, graphs, or algebra. Find the range of functions presented graphically.
3. 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.
4. Decide if a given function is linear, quadratic, exponential, or none of the above for functions presented algebraically, graphically, or in tables.
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 using the meaning of the logarithm.
  - (d) Graph exponential and square root functions, when given in transformation form, using efficient tables.
  - (e) Graph power functions and  $n$ th-root 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. Understand  $n$ th-roots, rational exponents and the connection between the two. Simplify  $n$ th roots and exponential expressions with rational exponents.
16. 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.
17. Analyze linear, exponential, and quadratic models to answer questions about the situations they represent. In particular, relate graphical features (like the  $x$ - and  $y$ -intercepts for all function or the vertex of 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.

**Weekly Workload:** This is an online course, but still an intense course. According to the University of Utah, a 4-unit course should have about 4 hours of lecture and 8 hours of outside study/homework time. This means that our online course will take the average student about 12-15 hours per week. Some students will be able to get by on less, and some students will need more.

Each week, complete one of the following successful habits:

- Make 4 posts in the Canvas discussions that contain your math thoughts. You can post questions about homework, help classmates, or write about topics related to this course that interest you;
- Spend some time in office hours talking about ideas from class, homework, learning strategies, etc.
- Work with a classmate to lead a study-session on a particular topic for other students in the class (announce these 48 hours head of time.);
- Start your HW early. You need to have score of 50% or higher on all HW assignments by 7am on the Monday before they are due (i.e. about 40 hours ahead of time).
- Reflect on exams and learning. This will be open to you in the weeks after exams.

**Extra Credit:** You can earn extra credit by doing more than one successful habit option per week. You can also earn extra credit for completing the UofU course evaluation at the end of the semester.

**Regrading Policy:** If a grade is recorded incorrectly, it is the students responsibility to let the instructor know in a timely manner (at the latest within 2 weeks of when the grade was recorded.)

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

Announcement Quizzes	2%	Weekly
Successful Habits	3%	Weekly
Quizzes	15%	Almost Weekly
ALEKS Homework	20 %	Weekly
Midterms	40%	Two total
Final Exam	20%	<b>You have to take the final to pass the course!</b>

**Credit/No Credit Option:**

- If you are taking Math 1010 as a prerequisite, it is easiest if you opt for a letter grade. You need a C or better to enroll in Math 1050 (College Algebr) or a B or better to enroll in 1080 (Precalculus). But if you choose to take Math 1010 CR/NC, when you want to enroll in the subsequent class, you will need to request a permission code. The permission code team will look up whether the underlying grade meets the requirements.
- This is the official University description of the credit/no credit option: The credit/no credit (CR/NC) option allows a student to enroll in selected courses outside of his/her academic plan, without the pressure of competing for a letter grade. By electing CR/NC, students are expected to complete the same work as students enrolled for letter grades. If you are interested in credit/no credit, consult the following:
  - University guidelines:  
<https://catalog.utah.edu/#/policy/B12v3LX0G?bc=true&bcCurrent=Grading%20Poli>
  - Dates for Choosing CR/NC:  
<https://registrar.utah.edu/academic-calendars/spring2021.php>
  - Consider speaking with an academic advisor to determine whether this is a good option.

**Scoring Information for the Above Activities:**

- **Announcement Quizzes:** Course documents and announcements are given in quiz format and have a short quiz about the content at the end. These “quizzes” begin with “A:...” Completing these is worth 3% of your grade. Suggested due dates are shown, but these can be completed at any time up to one day before the final.
- **Quizzes:** There will be at least nine take-home quizzes. You can access them on Friday (earlier by special arrangement) and they are due on Tuesdays. You will need to scan and upload them. The quizzes are worth 16% of your grade. The lowest quiz score will be dropped at the end of the term.
- **ALEKS Homework:** ALEKS is an adaptive homework system, which means it assesses what you know and what you don’t know and then customizes your assignments accordingly. In ALEKS, you will work on Objectives (the equivalent of homework assignments) and periodically take Knowledge Checks (quizzes that are not graded, but determine the customization of objectives). This is how your work in ALEKS contributes to our course:
  - *16% from Completing your Objectives.* There are 17 objectives in the course, one for each week and one for each exam. Their due dates are shown in ALEKS. Partial credit is awarded. Your lowest score is dropped at the end of the term.
  - *5% from Weekly Time Goals.* This is to encourage you to work on topics every week, throughout the week. To get full credit, you need to spend 6 hours each week in ALEKS, except in the first and last week and during exam weeks. Weeks start on Sunday, 12:00 am and run through Saturday, 11:59 pm. Note, if on the day after your time-goal is due, your objective goal is higher than your time goal, then your time goal will be adjusted.

- **Midterm Exams:** There are two midterm exams, each worth 20% of your grade.

All exams will be taken via Zoom. During exams, students are required to have their cameras and microphones turned on (though the microphone may later be muted) and have their head, hands, and workspace be visible. They are required to show identification before beginning the exam. There will be a mandatory “Zoom rehearsal” one-two weeks before the exam, where students confirm that their camera and microphone are set-up correctly, and also practice using the chat and raising their hand in Zoom.

Each exam will be 50 minutes long. Before each exam, students should print out or hand-copy templates to write answers on. These will be made available in Canvas a few days before the exam. At the end of a 50-minute period, students will scan their work and upload it to either Canvas or Gradescope, as instructed. Students may ask questions of their instructor through the chat feature in Zoom.

Students may also bring one page of notes (8.5 in by 11 in, writing on both sides) that they make during quizzes and exams. Each student should make their own notes. They should not use notes from other students or other sources.

Scientific calculator will be allowed. Students are required to scan and upload their notes with their exam. Phones should not be used or visible until the scanning phase of the exam. Students are not allowed to use any computer or online resources (including math sites and online calculators), notebooks or books, or to communicate about the exam with other humans. Not following these rules is considered academic misconduct and will be penalized as such. See further comments about academic misconduct below.

- **Final Exam:** The final is comprehensive and worth 20% of your grade. All the students in Math 1010 at the University of Utah take the same common final at the same time, including online students, and it will be on zoom on 5/3, at 3:30 pm.

**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.

### Exam Dates

**Exam 1:** Monday, March 1, 5:00 pm (on Zoom, End of Courses Week 6)

**Exam 2:** Monday, April 12, 5:00 pm (on Zoom, End of Courses Week 11)

**Final Exam:** Monday, May 3, at 3:30 pm on Zoom. This date and time is assigned by the University of Utah scheduling office. You can view the Fall 2020 final exam schedule at (math 1010 is listed under the departmental finals): <https://registrar.utah.edu/academic-calendars/final-exams-spring.php>

Students are not allowed to take early/late departmental final exam. Please do not schedule your trip before this date, or do not ask me to give you extra time to study.

### COMMUNICATION

- All course materials, such as lecture slides, assignments, solutions, grades, etc. will be posted on the Course Canvas site. Class announcements will be done via email through the Canvas server. You will be responsible for any information contained in them as well as the information announced in class.
- It is your responsibility to also regularly check your Umail (make sure you set up forwarding if you do not check it regularly), your Umail is the only way for me to communicate privately with you, there will be occasions during the semester that we may need to reach out to you individually (e.g. regarding a grade or assignment) and it is in your best interest to respond promptly.
- Feel free to contact me by email for questions at [krtolica@math.utah.edu](mailto:krtolica@math.utah.edu), I will do my best to answer emails promptly. I would like to encourage you to email me only if it is something personal that requires individual attention, if instead you have questions about logistics of the class, course material and assignments, and

anything else your classmates may wonder as well, please post a question on the Discussions Board instead. This way the information is shared quickly to the entire class, and each of you can benefit from seeing other classmates questions.

- I will always do my best to ensure the communication relevant to the course is clear and transparent, it is your responsibility as well to keep yourself updated by regularly checking: the announcements on Canvas, your Umail (or Canvas mail), the posts on the Discussions Board, and pay attention to the announcements given in class and Discussion Section.
- Students are expected to log in and check canvas everyday for posted announcements and assignments. Students are also strongly advised to set up notifications for canvas so they do not miss any important notifications.

**Grading Scale:** The grading scale is: A (93,100), A- [90,93), B+ [87,90), 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 at the end of the semester.

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

- Learning Assistants are undergraduate students who have taken this course previously, or a similar course, and who receive special training on how to help students learn science (see more details on the U of U Learning Assistant program page). LAs will help during class and discussion sections to facilitate student learning, they will also staff Study-Hall and hold Office Hours. LAs are not responsible for grading assignments and can be thought of as peer mentors. The names and contacts of the LAs will be posted on the Canvas website on the Teaching Staff page.
- 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.
- Math Center Online Tutoring, (Paid for by Your Student Fees):  
<https://www.math.utah.edu/undergrad/mathcenter.php>
- The Learning Center, 3 free tutoring sessions, \$5 after that, learning consultations:  
<https://learningcenter.utah.edu/>
- Here is information from the University about logistics in light of COVID-19. There is also information about financial assistance, counseling, the food pantry, and much more:  
<https://coronavirus.utah.edu/#students>.

**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.

**Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

**Student Names & Personal Pronouns:** Class rosters are provided to the instructor with the students legal name as well as “Preferred first name” (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and

your pronoun will be respected. If you need assistance getting your preferred name on your UIDcard, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email [bpeacock@sa.utah.edu](mailto:bpeacock@sa.utah.edu) to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.

**Safety Statement:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu)

- Learning Assistants are undergraduate students who have taken this course previously, or a similar course, and who receive special training on how to help students learn science (see more details on the U of U Learning Assistant program page). LAs will help during class and discussion sections to facilitate student learning, they will also staff Study-Hall and hold Office Hours. LAs are not responsible for grading assignments and can be thought of as peer mentors. The names and contacts of the LAs will be posted on the Canvas website on the Teaching Staff page.
- 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.
- Math Center Online Tutoring, (Paid for by Your Student Fees):  
<https://www.math.utah.edu/undergrad/mathcenter.php>
- The Learning Center, 3 free tutoring sessions, \$5 after that, learning consultations:  
<https://learningcenter.utah.edu/>
- Here is information from the University about logistics in light of COVID-19. There is also information about financial assistance, counseling, the food pantry, and much more:  
<https://coronavirus.utah.edu/#students>.

**Incompletes:** According to university policy, to be considered for an incomplete, a student must have 20% or less of the course work remaining and be passing the course with a C or better. You must request an incomplete grade and I will consider giving that grade only under exceptional circumstances.

**Syllabus subject to change:** This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas.