

# Foundations of Algebra, Math 4030

## University of Utah, Fall 2020

Anurag K. Singh

**Class** Monday and Wednesday, 3:00–4:20 pm, Online Synchronous.

**Contact** LCB 124, (801) 581-8647, [singh@math.utah.edu](mailto:singh@math.utah.edu), with e-mail preferred.

**Web-page** Via Canvas; official announcements and homework assignments will be posted there. Check in on Canvas at least twice a week for announcements and updates.

**Format** The class will be delivered *synchronously*, i.e., live at the time listed, via the Zoom video conferencing software. It is strongly suggested that you have a webcam and microphone to fully participate. While I will present course material during the class period, I also hope to make the class as interactive as possible. I strongly encourage your questions, and am happy to go over problems or do more examples to illustrate the topics at hand.

During class time, I suggest that everyone keep their microphones muted so as to eliminate background noise, but feel completely free to unmute yourself and interrupt with questions/clarifications. When speaking, please turn on your video if possible, if it wasn't already on.

Classes will be recorded and made available on Canvas, so if you miss a lecture you can watch it later. Class recordings will not be made available to the general public and will be deleted at the end of the semester, but be aware that a recording will exist for a few months. Because of this, please refrain from giving out any sensitive personal information during class time.

**Laptops** The Marriott library has a limited number of laptops for loan to students, and information about wifi options: <https://lib.utah.edu/coronavirus/checkout-equipment.php>

**Text** We will use Professor Aaron Bertram's lecture notes: <http://www.math.utah.edu/~bertram/4030/>

**Prerequisites** C or better in Math 2200 and (Math 2210 or Math 1260 or Math 1280 or Math 1321 or Math 3140).

**Office hours** Tuesday 10:30–11:30 am, and by appointment. I will also take questions at length after each class.

**Goals** This is a course on the foundations of algebra, designed for a future teacher at the secondary level.

Topics include: Basic set theory, equivalence relations, logic and truth tables, quantifiers, proof techniques including induction, numbers including unique factorization of integers and the fundamental theorem of algebra, polynomials, Euclidean and unique factorization domains, modular arithmetic, basic linear algebra applied to field extensions, constructible numbers, and some Galois theory.

**Homework** There will be weekly homework, typically due in class each Wednesday, except for the weeks in which there is a midterm. You may discuss the problems with others in the class, and with me during office hours. I encourage you to discuss homework problems in groups as a way to learn from each other, and to get to know each other in these complicated times. That being said, it is important to write up one's own solutions. The two lowest homework scores will be dropped; late homework will not be accepted except in extenuating circumstances such as illness. In such cases, please let me know as soon as possible that you need to submit late.

**Grading** There will be two in-class exams and a comprehensive final exam.

Homework:	40%	
Exam 1	20%	Wednesday, October 7
Exam 2	20%	Wednesday, November 11
Final Exam	20%	Friday, December 11, 3:30–5:30 pm.

Using the above weights, letter grades will be assigned *roughly* as follows: 93–100 = A, 86–92 = A-, 80–85 = B+, 77–79 = B, 74–76 = B-, 68–73 = C+, 61–67 = C, 55–60 = C-, 48–54 = D.

**Other dates** Classes begin: Monday, August 24  
Last day to add, drop (delete), elect CR/NC, or audit classes: Friday, September 4  
Last day to withdraw from classes: Friday, October 16  
Last class (for this course): Wednesday, December 2

**Tech issues** The online nature of the course presents unique challenges for the timed exams; dealing with these will require some flexibility and ingenuity on the part of all of us. All exams will be administered through Canvas and Zoom. They will need to be accessed during class times; you will have a pre-defined time period during which to take the exam, and then you will need to upload your solutions at the end. I will set-up some practice quizzes so that we can all go over these procedures. You may use any notes during the exams, but you are not allowed to consult with others or with internet sites.

A microphone and camera are strongly recommended for class attendance, but not strictly required. However, you will need a microphone and camera for the exams. Exams will be monitored on Zoom, at the regular class time/final exam time. I will ask you to turn on your camera, and will monitor the exam. If this arrangement will be impossible for you, please let me know as soon as possible.

You will submit your homework and exams online via Canvas. If you have a tablet or a similar computerized writing surface, the simplest method is usually to download the exam or homework pdf, write directly on that, and then upload the pdf to Canvas. You can also print out the exam, write on that, and then scan and upload the writeup. If you do not have a printer, you can simply write your solutions on a blank piece of paper, clearly indicating which problem you are solving, and then scan to pdf. If you do not have a scanner there are many apps that convert a smartphone into a scanner. Please make sure that you have an app that can convert the files into pdf format.

Please only upload one file per homework/exam. All files should be converted into pdf format so that I can mark them up online for you to receive comments.

**Communication** Class announcements will be via e-mail, through the Canvas server. Students should check Canvas regularly, and set up notifications that are directly forwarded to their e-mail inbox. You should also regularly check your UMail or forward it to an address that you monitor.

**COVID Specific** *In the Case of a Stay-at-Home Order:* Should another stay at home order go into place, the online nature of this course means that it should be largely unaffected. In this situation, I intend to keep teaching following the same format and schedule. However, I realize that for some students a stay-at-home order may come with additional burdens; if you are in this category, please e-mail me and I will work with you individually to come up with solutions.

*Protocol in the Case of Sickness:* If I happen to get sick, I will arrange an alternative instructor. Should one of you happen to get sick, please let me know via e-mail, and we will work out an arrangement for future assignments and exams. A reminder that all students, faculty, and staff who are given a positive COVID diagnosis must self-report at <https://coronavirus.utah.edu>.

*Mandatory Online Instruction Periods:* The class schedule will remain the same during this period.

## Resources and Policies

**ADA Statement:** 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, (801) 581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written 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, veteran's status, or genetic information. If you or someone you know has been harassed or assaulted on the basis of your sex, including sexual orientation or gender identity/expression, you are encouraged to report it to the University's Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, (801) 581-8365, or to 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 Student Services Building, (801) 581-7776. To report to police, contact the Department of Public Safety, (801) 585-2677.

**Campus Safety:** 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) 585-2677. 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 <https://safeu.utah.edu>.

**Student Names and Personal Pronouns:** Class rosters are provided to the instructor with the student's legal name as well as *preferred first name*, if previously entered by you in the Student Profile section of your CIS account; this can be managed online by you at any time. I will refer to you with the name and the pronoun that you prefer, in class or on assignments: please advise me of any changes or preferences. For assistance or support, please reach out to the LGBT Resource Center, <https://lgbt.utah.edu>.

**Diversity and Inclusivity:** It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for others. In addition, if any of our class meetings conflict with your religious events, please let me know so that I can make alternative arrangements for you.

**Undocumented Student Support Statement:** Immigration is a complex phenomenon with broad impact on those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at (801) 213-3697 or <https://dream.utah.edu>.

**Wellness Statement:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University. For helpful resources, contact the Center for Student Wellness at (801) 581-7776 or <https://www.wellness.utah.edu>.