

Introduction to Number Theory - Math 430 (3 credits) – Spring 2019

Instructor: Dr. Brent Hancock

Office Location: Samuelson 218E

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Class times: MWF 12:00-12:50am, Samuelson 113

Office hours: Mon/Wed 3:00-4:00 pm, Fri 1:00-2:00 pm, or by appointment (email to set up a time)

- Office hour visits: Plan ahead and bring your prior work so I can best assist you 😊

Course Resources:

- Optional Text: *A Friendly Introduction to Number Theory* by Joseph H. Silverman (4th edition)
- Access to Canvas online at <http://canvas.cwu.edu> (this is where I will post course handouts, grades, policies, announcements etc. so it is important that you log on regularly).
- Some type of calculator (graphing or scientific). Cell phones may not be used as calculators during exams.

Course Description:

This course introduces students to selected topics in number theory. In this course, students will apply fundamental concepts and algorithms in elementary number theory to solve problems and prove certain results. Students will form conjectures and collaboratively explore those conjectures by generating examples/counterexamples and formal proof. Learner objectives, outcomes and skills will likely include, but may not be limited to:

- Solving problems and proving results related to divisibility
- using the Euclidean Algorithm to find the greatest common divisor
- understanding and using the Fundamental Theorem of Arithmetic to compute and solve a variety of problems
- applying the Chinese Remainder Theorem
- understanding and applying Fermat's Little Theorem
- solving linear congruence equations
- investigating some famous historical theorems about number theory
- computing Pythagorean Triples and solving related problems

What the main course assessments look like at a glance (more details on the next page):

- Weekly homework sets
- Daily participation (individual and collaborative) in class
- A portfolio of select revised homework problems
- 2 "midterm" exams and a comprehensive final exam

Important Dates:

- **Final Exam:** Tuesday June 4 from 12:00-2:00 pm. All students must take the final exam at the scheduled time and date.
- **Memorial Day Holiday** is Monday May 27 (no class).

Important policies:

- No late work is accepted without *prior arrangements* made with me due to extenuating circumstances.
- Don't cheat, and don't plagiarize. Respect the CWU Student Conduct Code (<http://app.leg.wa.gov/WAC/default.aspx?cite=106-125>)
- I follow CWU's policies and recommendations for academic misconduct.

COURSE ASSESSMENT DETAILS

Homework sets:

So that you can practice the essential skills, procedures, and proofs in the course, there will be homework sets collected approximately once per week. The due date of each homework set will be indicated as each set is assigned (as well as on Canvas). Some problems on the homework sets will include further practice of skills developed during class, while others will ask you to explore and prove new results that build on the existing ideas discussed during class. Students are encouraged to work together on homework sets, but each student must submit their own writeup.

Mastery Portfolio:

Students will submit a portfolio at the end of the quarter comprised of select homework problems from throughout the course. The problems submitted will be revised solutions of problems previously submitted. The rationale behind this portfolio is to allow students to demonstrate mastery of particular topics that they might not have fully grasped earlier in the course. More details about the submission and contents of the mastery portfolio will be provided on Canvas and discussed in class at a later time.

Midterm Exams and Final Exam:

We will have two "midterm" exams in this class. Tentative dates for these exams are currently **April 24** and **May 22**, but these might need to be adjusted depending on the pacing of the course. The official exam dates will be announced in class well before the exam is scheduled to occur. Each exam will have an in-class portion, and one or more of the exams may additionally have a take-home portion (to be announced ahead of time). We will also have a cumulative final exam covering all the material from this course. You should bring your own calculator to each exam, and please note that *you will not be allowed to use your cell phone as a calculator* during exams.

Participation:

You are expected to actively participate during class in a variety of ways. For example, you are expected to contribute meaningfully to small-group discussions, ask questions, present solutions,

and share your individual and small-group ideas and questions during whole-class discussions. I may periodically assign short “daily” exercises (separate from the homework sets described above) to help guide our discussions/investigations in the following class. In such cases, students are expected to complete these exercises before the next class and be ready to present their solutions. Students are expected to arrive to class on time and to not leave class early (unannounced).

****Important Note about Exams and Quizzes**

Please note that there will be no makeup exams or quizzes. Exceptions will only be granted if you miss an exam due to a *verifiable and documented* medical emergency or other university-authorized absence (eg. official CWU sports team obligation, participation in religious observance etc.) and have given me *appropriate advance notice*. Please consult the University student handbook for details on what is considered to be a University-authorized absence, and provide me with a written request ASAP (i.e. before the drop deadline) if you think you will have a conflict with any test dates.

COURSE GRADE CALCULATION

Weight	Assessment category (grading scale)
25%	Homework Sets
5%	Mastery portfolio
40%	“Midterm” Exams (2)
25%	Final Exam
5%	Attendance and Participation

Letter grades will be assigned as follows:

A- 90.0 - 92.9%	A 93.0 - 100%	
B- 80.0 - 82.9%	B 83.0 - 86.9%	B+ 87.0-89.9 %
C- 70.0 - 72.9%	C 73.0 – 76.9%	C+ 77.0 - 79.9%
D 60.0 - 69.9%		
F 0 - 59.9%		

Accommodations for students with disabilities:

Students who need accommodation of their disabilities should contact me privately to discuss specific accommodations for which they have received authorization. If you need accommodation due to a disability, please register with Disability Support Services in Hogue 126. They may also be reached via email at (DS@cwu.edu).

Respect, inclusivity, and diversity:

In my classroom, diversity and individual differences are respected, appreciated, and recognized as a source of strength. Students in this class are encouraged and expected to speak up and participate during class meetings, **and** to carefully and respectfully listen to each other. So that everyone feels comfortable participating, every member of this class **must** show respect for every other member of this class. Be good to each other.

Cell phone policy:

I will not allow cell phones or similar devices to be used during exams. This includes using your phone as a calculator. During exams, please keep all phones out of sight and silent. If I see anyone using a cell phone during an exam, I may assign that student a zero on that exam.

Changes to the syllabus:

I reserve the right to make modifications to this syllabus at any time. In the event of such changes, I will notify the class and upload a revised syllabus on Canvas.