

Number Theory

MATH 102 – Spring 2020

👤 Dr. Joshua Wiscons (he/him/his)
📍 Brighton (BRH) 144
🗨️ **M,T,W** 12:00PM–1:00PM
And also by appointment
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🌐 webpages.csus.edu/wiscons/teaching/

"It matters little who first arrives at an idea, rather what is significant is how far that idea can go." - Sophie Germain

📄 **Catalog Description.** Theory of divisibility; some number theoretical functions; congruencies (linear and quadratic); some Diophantine equations. Simple continued fractions.

✅ **Prerequisites.** Grade of C- or better in Math 31 (Calculus 2)

📖 **Book.** *Elementary Number Theory*, Second Edition (Dover Books on Mathematics); by Underwood Dudley.

📅 **Typical Day.** A typical class meeting will consist of group work, discussion, and lecture.

⚙️ **Learning Outcomes.** In this course, students will (1) increase their capacity for critical thinking and fact-based reasoning, (2) develop the necessary competency with the concepts and mechanics of basic number theory for further work in mathematics and other fields, (3) improve their written and oral communication of mathematics, and (4) develop the skills and mindset for solving problems in a team. Specific content outcomes are to

- understand basic properties of integers including divisibility and unique factorization;
- be able to solve Diophantine equations;
- understand congruences, congruence arithmetic, and be able to solve linear congruence equations;
- know basic theorems in number theory, e.g. Fermat's, Wilson's, and Euler's Theorems;
- understand number theoretic functions such as the number of divisors of an integer; and
- know what a primitive root is and be able to find primitive roots.

👥 **Community Agreement.** Members of this class represent a rich variety of backgrounds and perspectives. Our class commits to providing an atmosphere for learning that respects diversity and recognizes it as a source of strength. While working together to build this intellectual community, we ask all members to:

- share their unique experiences, values, and beliefs;
- be open to the views of others;
- honor the uniqueness of their colleagues;
- appreciate the opportunity that we have to learn from each other in this community; and
- value each other's opinions and communicate in a respectful manner.

Get Connected

Visit Me [Brighton 144]

Visit the Math Lab [Brighton 118]

Explorer Our Community!

Don't know where to start?
Check out our Multi-Cultural Center

Some Resources

Me! Stop by or email me anytime!

Could benefit from accommodations?

Talk with me or visit the SSWD office [Lassen 1008]

Experiencing challenges with food and/or stable housing?

Visit our CARES website: www.csus.edu/basicneeds/

Course Components

Homework. These assignments (usually mixture of computations and proofs) are to be turned in on their due date at the beginning of class. You are *allowed and encouraged* to work together on homework, but you are expected to **write up your solutions on your own**. Solutions must be written clearly, should include all supporting work, and must be professional in appearance.

Participation. This component measures your level of engagement with your peers and in class-wide discussions. As such, regular, on-time attendance is very important, so please let me know if you need to miss class. Repeated absences will impact this portion of your grade.

Exams. There are 2 midterm exams *tentatively* scheduled for Feb. 28 and Apr. 17. There is also a Final Exam scheduled for Tuesday, May 12 from 8:00 AM–10:00 AM

Grade Composition

Homework	25%
In-Class Participation	10%
Midterm Exams	40% (20% × 2)
Final	25%

In general, letter-grade cutoffs will be standard: A 100-90%, B 89-80%, C 79-70%, D 69-60%, F 59-0%.

Accommodations. Any student needing academic adjustments or accommodations should speak with me privately as soon as possible. If you have one, please bring a copy of your accommodation letter from the [Services to Students with Disabilities \(SSWD\) office](#). All discussions will remain confidential. More information here: www.csus.edu/student-affairs/centers-programs/services-students-disabilities.

Getting Extra Help. *Please come talk with me if you have any questions!* Additionally, the Math Lab (Brighton 118) provides **free** assistance to students enrolled in lower division mathematics and statistics courses, but they might be able to help with this course too.

Technology The emphasis of this course is on conceptual understanding. Feel free to use calculators and/or computer software programs on the homework assignments, but only a **basic calculator** will be allowed on exams. (I'm a big fan of [Desmos](#) for graphing and [WolframAlpha](#) for other computations.)

Cheating Cheating will result in disciplinary action and will be reported to the [Office of Student Conduct](#). If you are unsure what constitutes cheating, please speak with me and review Sacramento State's *Academic Honesty Policy and Procedures* document here: www.csus.edu/umannual/student/stu-0100.htm.