

MATH 515: Introduction to Number Theory

Western Kentucky University – Spring 2022

Instructor: Hope Marchionda
Office: COHH 3103
E-mail: hope.marchionda@wku.edu (For a quick response, email is the best form of contact!)
Course Hours: At your leisure – but be careful!
Office Hours: I am available by appointment or capture! In addition, I am available via Discussion Board and Email on a very regular basis!

Course Description: An introduction to number theory, including, but not limited to, divisibility, quadratic reciprocity, theory of primes, Fermat's Theorem, Euler's Theorem, application problems.

Learning Outcomes: After the completion of this course, students will be able to:

- Reason and communicate proficiently in mathematics with regards to describing and explaining theory and application of number theory.
- Write rigorous mathematical proofs using theory development and a theoretical understanding of number theory.
- Analyze and generalize problems and their solutions.
- Make connections to topics taught in various branches of mathematics at various levels.
- Reason and communicate proficiently in mathematics with regards to describing and explaining theory and application of number theory.

Prerequisite: Admission to the Master of Arts in Mathematics program or permission of instructor.

Textbook: Pommersheim, J. (2010), *Number Theory*. Wiley.

Internet Access: You **must** have regular access to the internet to access email and the course website (Blackboard). This will help ensure that you do not fall behind. My primary forms of communication with you will be email and the discussion boards. Please check your email regularly and save class emails for future reference.

Attendance: We will not have a set meeting time when everyone will be online; however, you are expected to be online **frequently** each week to check your WKU email and the discussion board – this is **VITAL**. In a face-to-face class, we would meet in person just shy of 3 hours each week. In addition to this, you are expected to put in additional time outside of class for reading, completing assignments, and studying – this is typically figured as 1-3 hours per credit hour per week. So, in a face-to-face class that can range from 6 to 12 hours a week for one class. I will expect you to do the same amount work as if this course was meeting in person – I will not compromise the integrity of the course. Since we are not meeting in person, some students will find that they need to put in additional time to understand the material. Make sure you do not get behind!

ADA Statement: In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter from The Student Accessibility Resource Center.

Academic Dishonesty: Students who commit any act of academic dishonesty will receive from the instructor a failing grade in the course without possibility of withdrawal. The instructor will also present the case to the Office of Student Conduct for disciplinary sanctions.

Assessment / Evaluation: The course grade will be computed as follows:

Discussion Boards (10%): Even though this is an online course that utilizes an asynchronous environment, your participation is **expected** and therefore required. All homework questions should be posted on the appropriate DB forum/thread located on Blackboard so that the entire class can benefit from the discussion that follows the question. Please **do not** email homework questions. If you do, I will ask you to post that question to the DB. This ends up wasting valuable time. The rationale for this policy is that I want all students to benefit from all questions/comments, just as students would in a face-to-face class. The only exception to this rule is a question of a personal nature – those should always be communicated privately.

In each forum, you are expected to post comments and/or questions about assignments. Most importantly, you should respond to classmates' questions – just as you would participate in conversations during group work in a classroom. Since this “conversation” is not immediate in an online class, it is in your best interest not to wait until the last minute to work on your assignments. You should plan to spend time on the computer monitoring these discussions several days throughout the week. It is very important to keep in mind that while you may not have any questions to ask regarding problems that I assign, others will. Helping others is a GREAT way to reinforce your understanding of the material. In addition, sometimes you may think you think you understood a problem only to find out during a discussion that you were wrong OR that there were multiple ways to solve the problem. Participation in these discussions is a win-win situation.

Online discussions are a way for you to be “present” in class, like attendance in a face-to-face class. For each assigned DB, you will receive a fixed number of points. The number of points will be communicated at the time the assignment is made on the life-line calendar. If you meet all the requirements, you will receive all the points. If you do not meet all the requirements, you will receive a zero.

Tests (60%): Two exams will be given during the course of the semester. The exams will be proctored and announced well in advance so that arrangements can be made. Each exam will include a window of opportunity for you to take the test. This window will be several days, and it will always include a weekend. Only in extreme circumstances will a student be allowed to take an exam later than the testing window. Details about the exams will be communicated via email after classes are underway. It will be important for you to schedule your test right away so that we can make arrangements for any issue that arises.

Assignments (30%): Your homework will be weekly problem sets which will be posted each week. Please consult the life-line calendar each week for assignments. These assignments will be collected on a weekly basis and graded. More information about homework expectations can be found in the General Structure document posted on BB. You may at times want to consult mathematics sources in the library or on the internet. Feel free to share anything you reference with your classmates via the DB. You will find that doing the assignments and corresponding with classmates or with the instructor will increase your chances for success on exams.

All assignments should be turned in via the links given. Any assignment uploaded on Blackboard for me to look at should be either a **Word document or a PDF file – no other file types**. Handwritten assignments are acceptable if they are neat and scanned as a pdf file – no picture files. All assignments should be turned in as **ONE file**. Once an assignment has been graded and solutions posted, late assignments will not be accepted for any reason! The structure of weekly assignments, including due dates, will be explained in a subsequent document located on Blackboard. Also, please make sure that you do not copy your assignments into text boxes – your assignments **MUST** be uploaded as **ONE** document or **ONE** pdf file.

Determination of Final Course Grade: Final course grades will be determined using the following scale:

Percentage	0% – 59%	60% – 69%	70% – 79%	80% – 89%	90% – 100%
Letter Grade	F	D	C	B	A

Gradebook: Please consider the online gradebook as a courtesy to you, subject to errors given various upgrades and shifts in the software. I reserve the right to make gradebook corrections to keep it consistent with the syllabus so that your grade reflects true performance, not software or user error. If you see something that doesn't make sense, please alert me.

Withdrawal Dates: The last day to withdraw from this course without a grade and without paying a fee is Tuesday, January 24, 2023. The last day to withdraw from this course with a W, or change from credit to audit, is Thursday, March 30, 2023.

Disclaimer: The instructor reserves the right to change, alter, modify, or tweak anything in this document at any time and for any reason.

Regular and Substantive Interaction Statement: The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive Interaction at WKU, please visit the Regular and Substantive Interaction in Online and Distance Learning webpage. In this course, regular and substantive interaction between students and faculty will take place in the following ways:

- Regular communication via email or announcements made on Blackboard,
- Regular participation in weekly discussion boards, and
- Timely and detailed feedback on assignments provided within one week of submission.

Title IX Misconduct/Assault Statement: Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's [Sex and Gender-Based Discrimination, Harassment, and Retaliation](#) (#0.070) and [Discrimination and Harassment Policy](#) (#0.2040). Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's [Counseling and Testing Center](#) at 270-745-3159.