

MATH 595: Advanced Mathematical Thinking II

Western Kentucky University – Fall 2024

Instructor: Nicholas Fortune
Email: nicholas.fotune@wku.edu
Office: COHH 3111

Classroom: Online
Course Hours: At your leisure with deadlines
Office Hours: By appointment**

**I do not have set office hours for this class, but I am happy to meet with students via Zoom.
Just send me an email and we can find a time to chat via Zoom.

Course Description: 3 Credit Hours – Students will conduct their own research project regarding secondary students' mathematical thinking, applying what was learned in MATH 585 (Adv Mathematical Thinking I).

Learning Objectives: Upon completion of this course students will be able to:

- Apply content learned in MATH 585 to conduct their own research regarding students' mathematical thinking;
- Demonstrate a deep understanding of their chosen research methodology; and
- Develop a deeper understanding of ways to improve their own teaching via the results of their research project.

Prerequisites: MATH 585. Admission to the Master of Arts in Mathematics program is required for enrollment into this course.

Textbook: There is one required textbook for this course. It is the same book used in MATH 585 so all students should have them. If not, these books can be purchased from the WKU Bookstore, but I also have provided additional locations they can be found. You can also get hard copies or eBooks, that is up to you.

Creswell, J. W. & Poth, C. N. (2024). *Qualitative inquiry and research design: Choosing among five approaches* (5th Edition). Sage. ISBN-13: 978-1544398396. [Amazon](#).
[Sage](#).

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. Please check your email regularly and save class emails for future reference.

Course Calendar: A course calendar will be posted once the course begins. Be sure to consult this for an approximate course calendar with important dates.

Attendance Policy: 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 to 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. Make sure you do not get behind!

Course Requirements: Your grade in the course will be based on the following.

Reading Discussions (15%): Even though this is an online course that utilizes an asynchronous environment, your participation is **expected** and therefore required. There will be designated Reading Discussions located on Blackboard so that the entire class can participate in the discussion. Please **do not** email questions. If you do, I will ask you to post that question to the Reading Discussions. The rationale for this policy is that I want all students to benefit from all questions or 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. You are expected to post original comments and/or questions about the readings. But you also are expected to respond to classmates' comments or questions – just as you would participate in conversations during group work in a classroom. As this “conversation” is not immediate in an online class, it is in your best interest to be active on the Discussions daily, especially as this is a summer class.

Reading Discussions are a way for you to be “present” in class, like attendance in a face-to-face class. There will be a lot of Reading Discussions. The point value of each Reading Discussion will be determined by the number of questions that require engagement as well as the number of posts that are required as responses to classmates. For example, if a Reading Discussion had 5 questions and you need to respond to 2 classmates, there will be 7 points for that Reading Discussion. Points will be awarded on a per question basis.

Reading Reflections (15%): Part of this class is focused on reading articles: mathematics education articles about mathematics content and methodology papers. Some of these readings will be from our textbook, and some will be from articles that I post on Blackboard. There will be Reading Reflections that you turn in for a grade (deadlines will be on course calendar). Reading Reflections will be in the form of PowerPoint or Google Slides. A rubric will be provided. The Reading Discussions (previous item) is where you will discuss the articles with classmates. The Reading Reflections are where you demonstrate understanding of the content.

Capstone Project: In MATH 585 we learned how to conduct mathematics education studies. During that course, students drafted ideas for a mathematics education project that they will conduct in this course, MATH 595. All projects will involve interviewing high school students with a task-based interview protocol.

Proposal (15%): Before conducting the study, students must submit a proposal, which includes the finalized interview protocol. A detailed rubric will be provided on Blackboard.

Interview Transcripts (10%): Students will conduct their interviews and transcribe the interviews. Transcripts need to be submitted for proof of interview completion. More details will be posted on Blackboard and the Course Calendar.

Discussion Check-Ins (10%): There will be periodic points where students are required to make Discussion Board posts to talk about the status of their projects with other students.

Paper Draft (10%): Once the interviews are done and analyzed, students will start drafting their final research paper. There will be a deadline part-way through the semester where students will submit a draft of their paper for feedback from the instructor.

Paper Final (25%): This is the final research paper that will be graded. A detailed rubric will be provided.

Determination of Final Course Grade: The above assignments and assessments are weighted according to the noted percentages. 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

Understanding Course Grades:

- A** Pre-service or in-service teacher consistently demonstrates competencies that signal that they are proficient in the mathematical topics covered in the course. This qualification includes a deeper level of understanding than that expected of the students they are preparing to teach. Pre-service or in-service teacher demonstrates this level of understanding by consistently going beyond the information explicitly presented by the course instructor to completing new kinds of tasks. This ability to apply one's knowledge to new contexts and to put together various ideas is essential for effective classroom teaching because good teachers are able to respond to children's questions, to support and assess children's mathematical proficiency, and to interpret new curricula.
- B** Pre-service or in-service teacher occasionally demonstrates the competencies and the knowledge transfer abilities that characterize the mathematical proficiency of A-level students, but at times is limited to learning well just the information explicitly presented by the course instructor. Pre-service or in-service teacher shows evidence of better-than-acceptable level of mathematical proficiency in the topics studied and a deeper level of understanding than that expected of the students they are preparing to teach.
- C** Pre-service or in-service teacher consistently demonstrates good levels of performance on tasks measuring straightforward learning of course content, but rarely completes knowledge transfer tasks successfully. Shows evidence of an acceptable level of mathematical proficiency of the topics studied and shows evidence, although inconsistent, of a deeper level of understanding than that expected of the students they are preparing to teach.

- D** Pre-service or in-service teacher does not consistently show acceptable levels of performance, even on tasks measuring content explicitly presented by the course instructor. Although the pre-service or in-service teacher may have mastered some of the course content, and they show signs of considerable effort, serious questions persist about their mathematical proficiency and whether they have developed a deeper level of understanding than that expected of the students they are preparing to teach.
- F** Pre-service or in-service teacher shows a profile similar to that of the D student but, in addition, appears to be unprepared to teach others at this time. Pre-service or in-service teacher consistently exhibits lack of effort, profound and persistent misconceptions, and/or the failure to master some of the course topics.

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.

ChatGPT & Generative AI Statement: Artificial intelligence (AI) tools are not permitted for any type of work in this class. If you choose to use these tools, your actions will be considered academically dishonest and a violation of the [WKU Student Code of Conduct](#).

Regular and Substantive Interaction (Online Courses Only): 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 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.

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, Room 1074. The 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 (FNL) from The Student Accessibility Resource Center.

Pregnant and Parenting Students: Western Kentucky University does not discriminate against any student or exclude any student from its educational programs or activities, including classes or extracurricular activities, on the basis of pregnancy and/or pregnancy-related conditions such as, but not limited to, childbirth, false pregnancy, termination of pregnancy, or recovery therefrom. Students who seek pregnancy or pregnancy-related accommodations should make their requests as soon as possible via WKU's Title IX Website at www.wku.edu/titleix/ under the heading, "Pregnancy or Pregnancy-Related Conditions." Students can also contact the Title IX Coordinator, Ena Demir, via email at ena.demir@wku.edu or by phone at (270) 745-6867 to request accommodations or seek assistance. We encourage students and faculty to work together

to establish a plan that allows the student to complete the class and coursework without jeopardizing academic integrity and course standards. The Title IX Coordinator can help facilitate conversations between students and faculty regarding appropriate and reasonable accommodations. If you are a WKU student and believe that you have experienced an incident(s) of discrimination or harassment based on pregnancy (or pregnancy related conditions or issues), please report it to the Title IX Coordinator via email at ena.demir@wku.edu or by phone at (270) 745-6867. Additional resources for pregnant and parenting students can be found on WKU's Title IX Website at www.wku.edu/titleix/.

Title IX Misconduct/Assault: 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 Executive Director, Office of Institutional Equity/Title IX Coordinator, Ena Demir, 270-745-6867 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.

Inclusion Statement: Western Kentucky University (WKU) is committed to ensuring all members of our campus community have access to equitable and inclusive learning, working, and living environments. At the heart of our mission, we seek to provide holistic education and employment experiences that prepare students, faculty, and staff to become effective scholars, contributors, and leaders in our diverse and evolving communities. Consistent with our campus purpose statement and creed, this classroom will be a respectful space, welcoming all sexes, races, ages, national origins, ethnicities, gender identities/labels/expressions, intellectual and physical abilities, sexual orientations, faith/non-faith perspectives, income levels and socio-economic classes, political ideologies, educational backgrounds, primary languages, family statuses, military experiences, cognitive styles, and communication styles. If at any time during this course you are excluded or feel a sense of alienation from the course content, please feel free to contact me privately without fear of reprisal.

Land Acknowledgement Statement: The history of our community and land gives us the opportunity to recognize, respect, and appreciate our place within that history. Western Kentucky University (WKU) honors and acknowledges the Indigenous peoples' land on which this University was built. All land in the state of Kentucky was once Indigenous territory, which is why it is our duty to acknowledge that WKU exists on Native land. This particular region of Kentucky was home to both the Shawnee (Shawandasse Tula) and Cherokee East (GWJ&9A.5 Tsalaguwetiyi) tribes. We also honor and acknowledge the former residents of Jonesville. According to the [Jonesville History Project](#), "Jonesville was a predominantly African American community in Bowling Green, Kentucky, that was demolished in the 1960s to make way for the expansion of the WKU campus. This incident echoed a pattern across the country where the

power of eminent domain was utilized to seize property from minority communities for large public works projects under the guise of urban revitalization.”

Withdrawal Dates: The last day to drop this course without a grade, without paying a fee, and to change from audit to credit is Monday, August 26, 2024. The last day to withdraw from this course with a W or change from credit to audit is Monday, October 28, 2024.

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