MATH 504: Application of Technology to Problems in Mathematics

Western Kentucky University – Summer 2022

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

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

Course Description: 3 Credit Hours – Problem solving via non-routine problems from various branches of mathematics, including, but not limited to number theory, discrete math, linear algebra, calculus, probability, and statistics.

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

- Understand, within the confines of a mathematics classroom, what instructional technology is and what it is not,
- Utilize varies technologies to solve problems in several branches of mathematics,
- Choose appropriate strategies to solve problems and recognize when multiple strategies will work to reach a solution,
- Recognize and find multiple solutions when appropriate,
- Construct visual representations as needed and then analyze those constructs to reach a solution,
- Identify patterns and predict other outcomes using the identified patterns,
- Employ logic in solving a problem to arrive at a conclusion,
- Analyze and evaluate the mathematical thinking and strategies of others,
- Communicate mathematical thinking orally and in writing to peers, faculty, and others,
- Understand the importance and limitations of technology in the classroom, and
- Connect the use of technology to the K-12 classroom.

Restrictions: Enrollment is limited to students in Mathematics (049) or permission of instructor.

Textbook: There is no required textbook for this course. All course materials will be available on Blackboard.

Graphing Calculator: A graphing calculator is highly encouraged. You may use the function to insert screen shots of your work with the calculator. If you are using a TI, you can use TI Connect software, you should be able to download it for free from https://education.ti.com/en/products/computer-software/ti-connect-sw. However, there are other softwares that allow for similar outcomes (see next section).

Technology: We will also use many other technology platforms for assignments such as Desmos (https://www.desmos.com), GeoGebra (https://www.geogebra.org/?lang=en), and Microsoft Excel.

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.

Important Dates:

Classes Begin	Tuesday, July 5
Last Day to change from AU to CR	Thursday, July 7
Schedule Change Fee ($50)	Friday, July 8
Last Day to Withdraw/Change from CR to AU	Tuesday, July 26
Last Day of Class	Thursday, August 4

Assignments & Assessment: Your grade in the course will be based on the following:

Modules (70%): This course will be divided into content-based modules. Each module will have a due date for you to turn in all work associated with it. Please do not wait until the last minute to start an assignment – instead, budget your time and work when you can. Due dates will be adhered to unless the student contacts the instructor by email prior to the date the work is due. Based on circumstances and the student's prior history of turning in late work, the instructor may or may not allow an extension. Anyone not following this procedure will be penalized for late work. Once grades are posted for module no late homework will be accepted.

Assignments must be turned in via the links provided on Blackboard, not emailed to the instructor. If there is a problem uploading a document, then email me and I will give you instructions on how to proceed. You may type or handwrite your assignments, but all handwritten assignments must be legible even after scanning it for uploading purposes. If you scan your work to upload it, you must turn it in as **ONE** document; you can use your phone (e.g., Notes on iPhone or Genius Scan) to scan multi-page hand-written assignments. Any scanned assignments should be saved as a **.pdf** file.

Article Reading: There will be required reading with each module. For each module, you will participate in a set of Discussion Boards posts related to the article and will write a summary and critique of each article in the form of an annotated bibliography.

Annotated Bibliography (20%): You will write a short summary and critique of the article. More details about expectations will be provided on Blackboard.

Discussion Boards (10%):
After reading the article, you will post an **I/Q** to the discussion board. What is an I/Q? An I/Q is an acronym for a Statement of **Interest (I)** & a **Question (Q)**. Then, you will read and respond to at least 1 other classmates' I/Q. You must also post at least 3 times related to the assignments for each module. These can be asking questions or responding to questions. What they should not be is "I got 36" with no explanation. The discussion board is to get help from your classmates on the math problems.

Given that there are 5 modules, each DB for each module represents 2% of your overall grade. If you meet the above requirements, you will get the 2%. If you do not meet them, you will get 0%, there is no partial credit for DB participation.

What are the benefits to online discussion boards?

Participation the online discussion boards can ...

- Allow students to learn from one another and share ideas.
- Allow time for in-depth reflection- students have more time to reflect, research & compose their thoughts before participating in the discussion.
- Build online class community by promoting discussion on course topics.
- Facilitate learning by allowing students to view and to respond to the work of others. Allow students to work together to create a product or to come to an agreement on some topic.
- Develop writing and critical thinking skills.

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.

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 (FNL) from The Student Accessibility Resource Center.

Title IX Misconduct/Assault: Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) and Discrimination and Harassment Policy (#0.2040) at

https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf
https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf.

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.

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