

## EDUC 4302: Math Problem Solving in the Secondary Education

### SYLLABUS

Course	EDUC 4302: Math Problem Solving in the Secondary Education
Semester	Fall 2025
Course Type	Online
Textbook	There is no required textbook

### INSTRUCTOR INFORMATION

**John Lamb, Ph.D**

Adjunct Professor of Mathematics Education  
UT Tyler School of Education  
[jlamb@uttyler.edu](mailto:jlamb@uttyler.edu)

Best way to contact is through email. Responses are made within 24 hours during weekdays and by the next weekday on weekend correspondence if not sooner.

**OFFICE HOURS:** Tuesdays 6:00pm-7:00pm (In BEP 218 Classroom)

**Last Day to Withdraw from Courses:** November 3, 2025

### COURSE FORMAT AND DESCRIPTION

Topics in teaching mathematical content in 7-12 mathematics classrooms through mathematical problem solving strategies and technology designed around problem- and project-based instruction. Prerequisite: Students must be admitted into the School of Education's UTeach program prior to enrolling in this course. This will ensure that the students have the basic math and pedagogical knowledge needed to succeed in this course.

### COURSE EVALUATION AND REQUIREMENT DESCRIPTION

1. Assigned Readings	20% of Final Average
----------------------	----------------------

--Students are expected to read assigned articles and other resources throughout the semester. Students will complete online assessments throughout the semester pertaining to the assigned readings.	
<b>2. Investigative Reports</b> -- Each student will be required to complete investigative reports during the semester. These reports require student to research, create, and solve real-world problems connected to Tyler and the surrounding area. Student will be assessed on their mathematical content knowledge, communication of the problem, communication of the results, and appropriate use of technology.	<b>30% of Final Average</b>
<b>3. Exams</b> --Students in this course will complete three content exams, two zoom exams, and one final exam in this course that will evaluate the students' knowledge of content from the readings and from classroom activities and lessons associated with non-routine problem solving.	<b>50% of Final Average</b>

A=90-100%    B=80-89%    C=70-79%    D=60-69%    F=0-59%

Assignments are typically evaluated within one week of deadline submission.

## COURSE LEARNING OBJECTIVES

### Assessment and Standards Matrix:

Course Topics and/or Student Learning Outcomes The student is expected to...	Activities	Assessment (including performance-based)	Standards Alignment
Research, identify, examine, and discuss the historical principles and strategies of problem solving in the mathematics classroom.	Online discussions and Activities Readings	Reading Quizzes Exams and Final Exams	Mathematics 7-12 Standards: Standard VI INTASC Standards: 4 and 5 TEKS: 111.1-111.26
Solve and analyze non-routine problems addressing mathematical content in the Middle and High School Standards.	Online discussions and Activities Readings	Reading Quizzes Exams and Final Exams	Mathematics 7-12 Standards: Standards I-VI INTASC Standards: 4 TEKS: 111.1-111.26
Research and implement best practices in authentic problem- and project-based learning.	Online discussions and Activities Readings	Investigative Reports	Mathematics 7-12 Standards: Standard VII INTASC Standards: 4 and 5 TEKS: 111.1-111.26

**Topical Outline:** COURSE ONLINE SCHEDULE (Topics and Assignment dates will be available through the Canvas course that will launch the first day of classes)

The calendar below will indicate the topics to be covered and assignments to be completed on those dates. Any adjustments to the proposed calendar will be communicated to students during the semester using Canvas.

Week 1: Aug 25-31	Historical Perspective of Technology and Problem Solving in Math Education
Week 2: Sept 1-7	Eliciting Student Thinking, Questioning, and Productive Struggle (Reading Quiz #1)
Week 3: Sept 8-14	Numeration and Algebra Non-Routine Problems (Reading Quiz #2)
Week 4: Sept 15-21	Numeration and Algebra Non-Routine Problems (Reading Quiz #3)
Week 5: Sept 22-28	Exam #1
Week 6: Sept 29 to Oct 5	PBL, PrBL, and Creating Purposeful Acts for Students
Week 7: Oct 6-12	Geometry and Statistics Non-Routine Problems (Reading Quiz #4)
Week 8: Oct 13-19	Geometry and Statistics Non-Routine Problems (Reading Quiz #5)
Week 9: Oct 20-26	Exam #2
Week 10: Oct 27-Nov 2	Trigonometry and Pre-Calculus Non-Routine Problems
Week 11: Nov 3-9	Trig/Pre-Calculus and Calculus Non-Routine Problems (Reading Quiz #6)
Week 12: Nov 10-16	Teaching EVERY Student and Calculus Non-Routine Problems (Reading Quiz #7)
Week 13: Nov 17-23	Exam #3
Week 14: Dec 1-6	Investigative Report #2
Week 15: Dec 7-9	Final Exam

### Optional Text and Materials

Rock, D., & Brumbaugh, D. K. (2013). *Teaching Secondary Mathematics* (4th Ed). (ISBN# 9780415520492).

Lechner, G. (2010). *Creative problem solving in school mathematics* (2nd Ed). New York: MOEMS (ISBN# 1-882144-10-4).

Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2010). *Elementary and middle school mathematics: Teaching developmentally* (7<sup>th</sup> Ed.). Boston: Pearson Education, Inc. (ISBN-13# 978-0-13-702508-4)

Cathcart, W. G., Pothier, Y. M., Vance, J. H., & Bezuk, N. S. (2006). *Learning mathematics in elementary and middle schools: A learner-centered approach* (4th Ed.). Upper Saddle River, NJ: Pearson Education.

Philipp, R., & Cabral, C. P. (2005). *IMAP: Integrating mathematics and pedagogy to illustrate children's reasoning*. San Diego State University Foundation.

Donovan, M. S., & Bransford, J. D. (Eds) (2005). *How students learn: History, mathematics, and science in the classroom*. Washington, D.C.: The National Academies Press.

National Council of Teachers of Mathematics (2000). *Principles and Standards for School Mathematics*. Reston, VA.: Author.

Burns, M. (2000). *About teaching mathematics: A K-8 resource*. Sausalito, CA: Math Solutions Publications.

**Internet Resources**

TEA <http://www.tea.state.tx.us/>

National Technology Standards <http://cnets.iste.org/index2.html>

National Council of Teachers of Mathematics <http://www.nctm.org>

National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/vlibrary.html>

Shodor Interactivate <http://www.shodor.org/interactivate>

Database search for educational journals <http://library.uttler.edu/>

Creative Publications [www.creativepublications.com](http://www.creativepublications.com)

EAI Education [www.eaieducation.com](http://www.eaieducation.com)

Texas instruments <http://education.ti.com/>

AIMS [www.AIMSedu.org](http://www.AIMSedu.org)

Eye on Education [www.eyeoneducation.com](http://www.eyeoneducation.com)

Casio <http://www.casio.com/education/>

NASCO [www.eNASCO.com](http://www.eNASCO.com)

**Course Policies:**

- **Attendance.** Your participation are important and required to do well in this course. Students are expected to come to class and be well prepared to engage in scholarly discussion on the day's scheduled subject matter.
- **Make/Up exam.** There will be NO make/up activities or exams for this course unless absence is due to an emergency. Students are expected to submit relevant documentation ( e.g. doctor's note, funeral notice, tow-truck receipt, etc.) when requesting a make/up activity.
- **Written Assignments.** Written assignments MUST be typed using **double spaced lines and have page numbers**. In addition, work submitted should reflect a professional quality in terms of scope, depth, writing mechanics, and appearance that would be expected of students at a prestigious university. Proofread all assignments as only materials with minimal or no errors will receive high scores. **Type assignments in an easily-readable 12 point (e.g. Times New Roman, Helvetica, Tahoma)**
- **Late Assignments** (turning in after due date) Assignments are due at the beginning of class. **Assignments that are one day late will be lowered 20%. Papers that are two days late will be lowered 50%. No assignments will be accepted after 48 hours unless arrangements have been made with the instructor.**
- **Academic Dishonesty.** To be successful in this class, you must invest time for study. Honesty is expected. Academic dishonesty (cheating, plagiarism, collusion) will NOT be tolerated and will result in a grade of zero (0) for the assignment. A second infraction will result in automatic failure of the class. Dishonesty is defined as (i) the use of unauthorized materials, (ii) any communication with peers during quizzes, (iii) representing another's work as one's own (i.e. plagiarism) or (iv) fabricating information. The professor reserves the right to determine occurrences of cheating. Additional information on Academic Dishonesty is found in the Selected University Policies section of this syllabi.
- **Canvas:** Students will access class notes, assignments, grades and course information through Canvas. Any changes to the course schedule, schedule of assignments, or any special assignments will be posted on Canvas. Students are expected to regularly check Canvas for updates and to download any class handouts.
- **Cell Phone / Pager / PDA / Blackberry usage:** Cell phones, pagers, etc., are not to be used during class. Turn such devices off or on vibrate and do NOT access them during class. The use of cell phone or other electronic communication devices during exams is prohibited. **Text messaging should be done before or after class!**
- **Artificial Intelligence:** This course will address the topic of AI in Education through readings, discussions, and specific usage in the course. The instructor will provide specific expectations pertaining to AI on individual assignments during the course. If no AI statement is provided in an assignment, the expectation is that all work submitted by the student is solely their own with AI being used as a resource and not used to create or generate a sizeable percentage of the work for that assignment. The following AI Usage

statement was generated by Perplexity.ai when prompted using the previous sentences written by the instructor. "AI Use in This Course

This course will explore the topic of AI in Education through readings, discussions, and specific applications within coursework. For each assignment, the instructor will provide clear expectations regarding the permitted use of AI tools. If no AI guidance is provided for a particular assignment, the default expectation is that all submitted work must be entirely your own. In such cases, AI may be used only as a supplementary resource (e.g., for brainstorming, fact-checking, or editing ideas) and must not be used to create or generate a substantial portion of the final product. Misrepresentation of AI-generated content as your own work may constitute academic misconduct under college policy."

### College of Education and Psychology (CEP) Vision and Mission

#### Core Purpose of the College of Education and Psychology

To prepare competent, caring, and qualified professionals in the field of education, psychology, and counseling; to foster discovery; and to advance the knowledge base in our respective disciplines.

**Vision:** The CEP will be a global leader in responding to needs in the fields of education, psychology, and counseling, with a focus on the East Texas region, by creating innovative academic and scholarly pathways and partnerships.

**Mission:** The mission of the CEP is to prepare competent and passionate professionals in the fields of education, psychology, and counseling; to advance knowledge and expertise; and to impact these fields locally, regionally, nationally, and internationally.

#### UT TYLER'S SCHOOL OF EDUCATION STANDARDS FOR EDUCATOR PREPARATION PROGRAMS

Texas Education Standards: The School of Education are committed to teaching and implementing the Texas Educator Standards at the highest level. The School of Education faculty use the Texas Education Standards, along with the Interstate New Teacher Assessment and Support Consortium (InTASC) standards used by educator preparation programs throughout the United States.

The list of Texas Education Standards can be accessed [here](#).

Access the Code of Ethics and Standard Practices for Texas Educators can be accessed [here](#).



## University Policies and Information

Last Update – 5/30/2024

### Withdrawing from Class

Students may [withdraw](#) (drop) from this course using the [Withdrawal Portal](#). Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email [enroll@uttyler.edu](mailto:enroll@uttyler.edu) to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support

options or assistance. Make sure to carefully [read the implications for withdrawing from a course and the instructions](#) on using the [Withdrawal portal](#).

Texas law prohibits students from dropping more than six courses during their entire undergraduate career\*. The six courses dropped include those from other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. **CAUTION #1:** Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule](#). **CAUTION #2:** All international students must check with the [Office of International Programs](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms. **CAUTION #3:** All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. **CAUTION #4:** All veterans or military-affiliated students should consult with the [Military and Veterans Success Center](#).

\* Students who began college for the first time before 2007 are exempt from this law.

## Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).

## Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

## Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade only when all of the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor,

and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

## Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the [Registrar's Form Library](#).

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

## Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler/> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>, the SAR office located in the Robert Muntz Library, LIB 460, email [saroffice@uttyler.edu](mailto:saroffice@uttyler.edu), or call 903.566.7079."

## Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it

difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center \(MVSC\)](#) has campus resources for military-affiliated students. The MVSC can be reached at [MVSC@uttyler.edu](mailto:MVSC@uttyler.edu) or via phone at 903.565.5972.

## Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

Traditional face-to-face classes: Attend classes on the regular meeting days/times.

Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.

Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

## Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

## FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements to protect your confidential information.

## Absence for Official University Events or Activities

This course follows the practices related to [Excused Absences for University Events or Activities](#) as noted in the Catalog.

## Absence for Religious Holidays

This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#).

## Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at [parents@uttyler.edu](mailto:parents@uttyler.edu) and also complete the [Pregnant and Parenting Self-Reporting Form](#).



## **Campus Carry**

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.