FLORIDA ATLANTIC UNIVERSITY

NEW COURSE PROPOSAL
Undergraduate Programs

Department N/A

College Honors College

*(To obtain a course number, contact **erudolph@fau.edu**)*

UUPC Approval 3/25/24
UFS Approval _____
SCNS Submittal _____
Confirmed _____
Banner Posted _____
Catalog _____

Prefix MGF

Number 1130

(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)

Lab Code

Type of Course Lecture

Course Title Honors Mathematical Thinking in Context I

Credits *(See Definition of a Credit Hour)* 3

Effective Date *(TERM & YEAR)* Spring 2025

Grading *(Select One Option)*

Regular (●)

Sat/UnSat ( )

Course Description *(Syllabus must be attached; see Template and Guidelines)*

Through this course, students will utilize multiple means of problem solving through student-centered mathematical exploration. The course is designed to teach students to think more effectively and increase their problem solving ability through practical applications and divergent thinking. The course is appropriate for students in a wide range of discipline/programs.

Prerequisites, with minimum grade* None

Corequisites None

Registration Controls *(Major, College, Level)* Honors College

***Default minimum passing grade is D-.** **Prereqs., Coreqs. & Reg. Controls are enforced for all sections of course**

WAC/Gordon Rule Course

[✓] **Yes** [ ] **No**

WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to proposal. See WAC Guidelines.

Intellectual Foundations Program (General Education) Requirement *(Select One Option)*

Math/Quantitative Reasoning

General Education criteria must be indicated in the syllabus and approval attached to the proposal. See Intellectual Foundations Guidelines.

Minimum qualifications to teach course

Master's degree in mathematics or related field

Faculty Contact/Email/Phone

William O'Brien/wobrien@fau.edu/6-8033

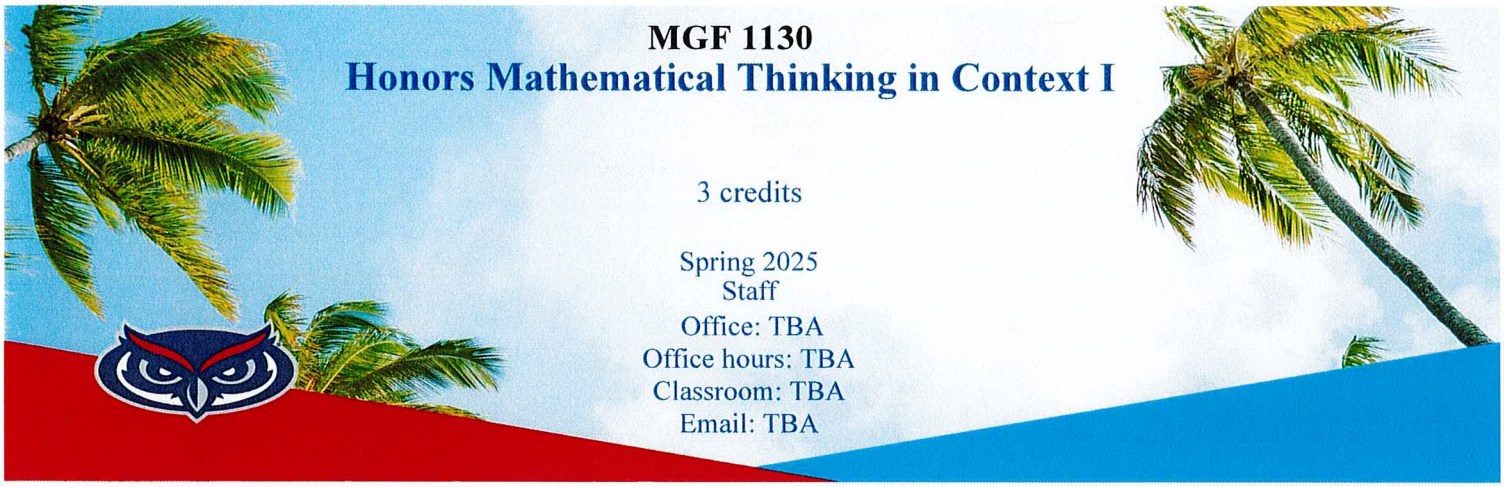
List/Attach comments from departments affected by new course

See attached

Approved by / ***Date***

Department Chair	[signature]	2/29/24
College Curriculum Chair	Rachel Corr	2/27/24
College Dean	[signature]	2/29/24
UUPC Chair	Korey Sorge	3/25/24
Undergraduate Studies Dean	Dan Mecroff	3/25/24
UFS President		
Provost		

Email this form and syllabus to mjenning@fau.edu seven business days before the UUPC meeting.



MGF 1130
Honors Mathematical Thinking in Context I

3 credits

Spring 2025
Staff
Office: TBA
Office hours: TBA
Classroom: TBA
Email: TBA

Course Description

Through this course, students will utilize multiple means of problem solving through student-centered mathematical exploration. The course is designed to teach students to think more effectively and increase their problem solving ability through practical applications and divergent thinking. The course is appropriate for students in a wide range of discipline/programs.

Instructional Method

In-Person. There is no remote option for this course.

Prerequisites

None.

Goals and Outcomes

Mathematics is a peculiarly human endeavor that attempts to organize our experience in a quantitative fashion. It aids and supplements our intuitions about the physical universe and about human behavior. The Mathematics Core requirement is intended to give students an appreciation of mathematics and prepare them to think precisely and critically about quantitative problems.

After completing this course students will be able to:

- SLO 1 - Identify and explain mathematical models and their applications.
- SLO 2 - Determine and apply appropriate mathematical and/or computational models and methods in problem solving.
- SLO 3 - Display quantitative literacy.

Course Objectives

1. Determine efficient means of solving a problem through investigation of multiple mathematical models. (SLO 1 & 2)
2. Apply logic in contextual situations to formulate and determine the validity of logical statements using a variety of methods. (SLO 2)
3. Apply mathematical concepts visually and contextually to represent, interpret and reason about geometric figures. (SLO 1 & 3)

4. Recognize the characteristics of numbers and utilize numbers along with their operations appropriately in context. (SLO 1)

5. Analyze and interpret representations of data to draw reasonable conclusions. (SLO 3)

Gordon Rule, Computational

This course satisfies the Gordon Rule, Computational requirements. Computational skills will be developed and assessed throughout the entire course by worked examples provided during lectures, and homework and exam questions, that require calculation of mathematical quantities by hand or with the aid of calculator.

Note of Honors Distinction

This course differs substantially from the non-Honors version. First, and most importantly, the course is an agreement between the student and instructor that they will work together collaboratively to ensure a significantly enriched learning experience in a manner consistent with other Honors-designated courses at FAU. This means the course will produce substantive work that reflects interdisciplinarity and connections among academic fields, research and direct access to sources of knowledge pertinent to the field, leadership, creative and critical thinking, and engagement with the world outside the university. Secondly, the writing component of the course will be much more demanding, and will prepare students for upper-division college writing and for work on the Honors Thesis. Students will be exposed to vocabulary of a specifically theoretical nature, and will be expected to comprehend new concepts and to deploy these new terms in their own critical thinking and writing. In addition, we will begin professionalizing our own readings and analyses of these texts. Students will be expected to familiarize themselves with the history and the ongoing critical and scholarly conversation about these works, and will give in-class presentations about critical history and about the living scholars in the field as it now stands. Students will also engage with the theoretical tools used by today's reading community to study literature. Finally, the course will develop critical attitudes and analytic skills that will teach the student to think for him-or-herself.

Course Evaluation Method

Semester grades will be based on the factors listed below:

5%	Class attendance and participation
15%	Homework
20%	Quizzes
60%	Tests

All grades will be posted in the Canvas gradebook.

1. **Class Participation and Attendance:** While the instructor will do some lecturing, a large share of class time will be spent in individual and group activities. Student participation is expected, and will count as part of the final grade. At all times, students are expected to show common courtesy in the classroom.
2. **Homework:** Each homework assignment consists of reading from the text and completing the assigned problems. Homework solutions should include not only your answers, but full justification for your reasoning. Explain how you know your answer is correct. Clarity of exposition is important, and you should strive for well-written, polished solutions. You will receive full credit for a complete,

correct, well-written solution. For the most part, collaboration on homework with other members of this class is allowed, although solutions must be individually written up and collaborators must be acknowledged. It will be made clear when collaboration is not permitted. Homework should be submitted by the posted deadline to get credit.

- **Quizzes and make-up policy.** Most weeks, we will have a quiz to help ensure that you stay on top of the material. Your lowest quiz score will be dropped for the purposes of determining your quiz grade. Makeup quizzes are not permitted without prior consultation unless there is a documented illness or emergency.
- **Tests:** There will be three in-class tests during the semester. Make-up exams are rarely given. I will give make-up exams only if you are ill, if there is a documented emergency, or if you make arrangements with me at least one class period before; if you are ill, I expect a letter from a physician verifying this. Otherwise, if you miss an exam you will receive a 0.
- It is the responsibility of the student to keep up with due dates and times for the various assignments. The assignment due dates and times are available on Canvas. The student is responsible for completing each homework assignment, quiz, and test on time and during the time window it is available.
- Students must give themselves ample time to complete assignments well before the posted due date as some assignments may take more time to complete when compared to other assignments.
- Students must check the "Announcements" tab periodically for information regarding the class.

Course Grading Scale

Letter Grade	Percent
A	100% - 93%
A-	<93% - 90%
B+	<90% - 87%
B	<87% - 83%
B-	<83% - 80%
C+	<80% - 77%
C	<77% - 65%
D	<65% - 55%
F	<55% - 0%

Policy on Makeup Tests, Late Work, and Incompletes (if applicable)

If a student is unable to submit an assignment on time, it is the student's responsibility to contact the instructor and provide documentation prior to the due date of the assignment for consideration for a delayed submission. Circumstances for a delayed submission include situations that seriously disrupt and affect the health and well being of the student. Be mindful that these do not include changes in work schedules, vacations or "computer problems". Makeup tests will be given only under circumstances which coincide with university policy. If you will miss an assignment, you must provide the instructor a written, verifiable excuse prior to the deadline in order to make up the assignment. Documentation received by the instructor after the deadline for the assignment will only be acceptable for emergency situations. Request

for a make up should be forwarded to the course instructor and documentation for a legitimate excuse must be submitted along with the request. It is up to the instructor to approve or deny make up opportunities if appropriate documentation is provided and a make-up date can be reasonably found. The decision of the instructor to approve or deny make up opportunities is the final decision. Doctor notes from immediate family members are not accepted. If a make up is approved, then the make up must be completed in reasonable amount of time determined by the instructor. If the make up is not completed within the reasonable amount of time determined by the instructor, then no make up will be provided.

Calculator

You must have a TI-30Xa (or TI-30Xa Solar) basic scientific calculator for quizzes and exams, and this is the only calculator that is allowed. You can buy this calculator at most major retailers (Amazon, Walmart, Target, Staples, etc.), where it is approximately $10.00. You may, of course, use any calculator or online tool (such as Wolfram Alpha) to complete homework exercises.

Policy on the Recording of Lectures

Because of a new Florida Statute in 2021, the following model language is suggested for inclusion in course syllabi, at the discretion of individual faculty:
Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

Attendance Policy

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http:// www.fau.edu/counseling/

Disability Policy

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

Code of Academic Integrity

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001.

Honors College Academic Honor Code is available at https://www.fau.edu/honors/academics/honor-code/

Required Texts/Readings

Discovering Mathematics: A Quantitative Reasoning Approach by Richard N. Aufmann, 2nd Edition, Cengage, 2025

Course Topical Outline

Week 1	Syllabus, Introduction to Problem Solving 1.1 Inductive and Deductive Reasoning 1.2 Estimating Quantities and Graphs; Scientific Notation
Week 2	1.3 Problem-Solving Strategies (Polya) 1.4 Introduction to Fair Division
Week 3	2.1 Sets and Set Operations (Unions, Intersections, and Complements) 2.2 Categorical Logic 2.3 Propositional Logic

Week 4	2.4 Investigating Fallacies Review for Test 1
Week 5	**Test 1** 3.1 Ratios and Rates 3.2 Metric systems
Week 6	3.3 Proportions 3.4 Percent
Week 7	3.5 Variation 4.1 Simple Interest
Week 8	4.2 Compound Interest - Future and Present Value 4.3 Annuities - Future and Present Value
Week 9	4.4 Credit Cards 4.5 Student Loans
Week 10	4.6 Auto Loans 4.7 Mortgages 4.8 Stocks, Bonds, and Mutual Funds
Week 11	**Test 2** 7.1 The Counting Principle 7.2 Permutations and Combinations
Week 12	7.3 Probability and Odds 7.4 Addition and Complement Rules for Probability
Week 13	7.5 Conditional Probability 7.6 Expectation
Week 14	9.1 Apportionment 9.2 Introduction to Voting
Week 15	9.3 Weighted Voting Systems **Test 3**