COURSE SYLLABUS
MA 630 - Foundations of Advanced Mathematics

I. INSTRUCTOR INFORMATION

A. Name: Dr. Jared Painter

B. Office: MAB 124

C. Office Phone Number: 256-765-4411

D. E-mail Address: jpainter@una.edu

E. Online Office Hours: MW 9:00 - 9:50 PM and TR 1:00 - 1:50 PM

II. COURSE INFORMATION

A. Foundations of Advanced Mathematics, MA 630-I01, 3 Credit Hours

B. Fall 2020, Section I01

C. Class meetings: Online through UNA Canvas

D. Prerequisites: None

E. Course Description: Foundational topics in mathematics including propositional logic and inference, set theory, proof writing techniques, functions and relations, elementary number theory, and foundations in algebra and analysis.

F. Course Content: MA 630 serves as the Foundations course for the online Master of Science in Mathematics Program. This course sets the tone for the master's program. As such, the focus will be on foundational topics including LaTeXtypesetting, writing mathematically rigorous proofs using a variety of techniques, set theory, functions and relations, elementary number theory, and other topics selected by the instructor.

G. Course Objectives: The primary objective of this course is to reintroduce students to a wide range of advanced mathematical topics in order to continue their study of mathematics at the graduate level. In particular, objectives of this course include (but are not limited to):

0. Recall and apply statements of definitions and results in advanced mathematics.
1. Prepare mathematical documents using the LaTeXtypesetting system.
2. Communicate mathematics through presentations and discussions of solutions to problems.
3. Write formal, mathematically rigorous proofs.
4. Solve computations problems in advanced mathematics.

III. TEXTBOOK AND SOFTWARE

A. Textbook: *Foundations of Higher Mathematics*, Fletcher P. and Patty C. (1996), Third Edition. Brooks/Cole Publishing Company. Video lecture notes will be based on this textbook. Available for purchase through the UNA Bookstore or Amazon

Additional instructional material will be created by the instructor or delivered through free, open source textbooks or course notes. Open source textbooks to be used throughout the course may include:

- Sundstrom T. (2018) *Mathematical Reasoning: Writing and Proof.* Retrieved from the American Institute of Mathematics Open Textbook Initiative.

B. Software:

- LaTeX
- Zoom
- Office Lens or Microsoft OneDrive App (for scanning documents)

C. Calculator Policy: A scientific calculator may be helpful for certain exercises. Cell phones may not be used as calculators.

IV. **HARDWARE REQUIREMENTS** Access to a computer with support of modern browsers and plug-ins is required. A microphone or web cam will be required for students to interact with the instructor during online office hours using Zoom. **Chromebooks are not supported for this course** as they do not support the required browser plug-ins. Additionally, it is recommended that you use either the Firefox or Chrome web browser for optimal functionality in Canvas.

- Hardware requirements for using Canvas.

V. **COMMUNICATION**

The official method of communication at UNA is UNA portal, with emphasis placed on university email. Any emails sent through a **non-UNA** email address will not be replied to. I will respond to all emails within 2 business days.

- Please post your questions about the course in the corresponding discussion board. Always check the boards before e-mailing or creating a new question post. If you know the answer to a question, please feel free to post the answer. I will address the questions on the discussion boards as well.
- You may also call or drop by my office during regularly scheduled office hours. If these times do not work for you, please email me for an appointment.
- Feel free to use our Zoom e-classroom (the link posted on the Canvas homepage) at any time for collaborations with or without the instructor.

VI. **EXPECTATIONS**

- Please allow up to 48 hours (excluding weekends and University holidays) for instructor replies to any Canvas messages, emails, or discussion posts.
- Please allow up to one week for instructor feedback on any graded assignments.
- Adhere to the UNA Code of Student Conduct.
- Do not use profanity.
- Be mindful of your tone. Unlike face-to-face meetings or even phone calls, those who read your messages don't have the benefit of your pitch, tone, inflection, or other non-verbal cues.
- Ensure that criticism provided in feedback or discussion is constructive. Remember, online messages live forever. The are easily forwarded.
- Don't reply in anger. If it makes you feel better, go ahead and write the message, then delete it. Usually a day or two afterwards you'll not only understand but also appreciate the wisdom of restraint.

VII. WEBCAM AND MICROPHONE

Enrollment in this course requires a webcam (with a microphone).

VIII. RESPONDUS LOCKDOWN BROWSER + MONITOR

Respondus is an online proctoring system which records you through your webcam and microphone which you take an exam. You will need to take each Module Exam through Canvas using the Respondus LockDown Browser. Information about Respondus (including instructions for students) is contained in Module 0. It is highly recommended that you download Respondus and take the Respondus Monitor Practice Quiz as soon as possible and contact the instructor or technical support immediately if there are any issues. *There will be no extensions on exams due to technology difficulties.* You will need to show your UNA or state-issued ID and scan the room and desk space with your webcam in order to take the exam. *The instructor reserves the right to prosecute any academic indiscretions to the full extent under the University Academic Honesty Policy.* If you are disconnected or experience a technical problem while you are taking an exam, you must contact the instructor immediately, delaying communication about the problem will result in less positive outcomes. After contacting the instructor, submit a Canvas support ticket.

IX. GRADING SCALE

Grades will be assigned according to the following scale:

A	90% - 100%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	Below 60%

*The instructor reserves the right to adjust the grading scale if necessary.

X. GRADING PLAN

Grades will be calculated as follows:

LaTeX Typesetting Test	5%
Quizzes	10%
Homework	40%
Collaboration Boards	10%
Exam	35%

Grades will be posted online through CANVAS.

XI. COURSE CONTENT

A. LaTeX Typesetting Test (5%)

As part of Module 0, students must demonstrate proficiency in the LaTeXmathematical typesetting system (which is what professional mathematicians use to prepare documents). They Typesetting Test will be graded as either Pass (full credit) or Fail (no credit). Details are posted to Canvas.

B. **Homework (40%)**

There will be several homework assignments throughout the semester (roughly two per module - not including Module 0). Homework assignments will be posted to Canvas. *Homework must be typeset in LaTeXand submitted electronically in Canvas.* Students will receive instructor feedback on their initial homework submission, after which there will be a revisionary period before the final submission. For details, please see Canvas. Each homework problem will be graded on the following 0-3 point scale:

- 0 points: The solution is incomplete, has a major conceptual mistake, or is not written in an acceptable mathematical format.
- 1 point: The solution is on track to becoming a correct solution, but it is incomplete or has a major conceptual mistake.
- 2 points: The solution has only a few easily identified, minor mistakes or notation/language issues, and it would be acceptable after these minor mistakes are corrected.
- 3 points: The solution is correct.

The homework is designed to both reinforce concepts covered in class and enhance students' writing skills. Mathematical writing is a *process* and a skill which requires practice to hone. Please do not use your first submission to submit a "rough draft" of your homework solutions. You should view the solving/writing/revision process as a continuous one. Students are encouraged to consult with the instructor during any part of this process.

While working with others on homework is not prohibited, students must write up their solutions *individually.* Students are prohibited from searching the internet for solutions to homework problems.

C. **Collaboration Boards (10%)**

Each module contains a collaboration board. It is expected that students will use this each collaboration board to collectively compile a complete set of solutions to the additional problems posted for each module in order to prepare for the corresponding exam. To earn full points for this collaboration board, each student must complete at least one of the following:

- Submit a complete solution to a practice problem. Solutions may be posted as .pdf files or Overleaf links.
- Make a helpful comment or ask an insightful question on another student's posted solution.
- Provide a hint on a problem that another student is stuck on.

There is not partial credit for participation.

D. **Exams (35%)**

There will be equally-weighted exams (one per module) administered through Canvas. The exam format is free response. Depending on the exam, you will be given a window of 12-48 hours in which you may access the exam, and you will be given a time limit of 1-4 hours in which the exam must be completed. Each exam must be completed in one sitting. *Exams require the Respondus LockDown Browser and a webcam.* If you have a *legitimate* need to take an exam early, please contact the instructor. Each exam problem will be graded on the following 0-10 point scale:

- 0-3 points: The solution is incomplete, has a major conceptual mistake, or is not written in an acceptable mathematical format.
- 4-6 points: The solution is on track to becoming a correct solution, but it is incomplete or has a major conceptual mistake.

- 7-9 points: The solution has only a few easily identified, minor mistakes or notation/language issues, and it would be acceptable after these minor mistakes are corrected.
- 10 points: The solution is correct.

E. **Late Work and Additional Grading Policies:** In general, no late submissions will be accepted. In the event of a legitimate emergency, contact the instructor *immediately*.

XII. ACADEMIC INTEGRITY

XIII. DISABILITY SUPPORT SERVICES

XIV. INFORMATION TECHNOLOGY ACCEPTABLE USE STATEMENT

XV. WITHDRAWAL PROCESS

XVI. ACCESSIBILITY STATEMENTS, PRIVACY POLICIES, ACADEMIC SUPPORT AND INSTITUTIONAL SUPPORT RESOURCES

1. **Accessibility Statements**
   - Canvas
   - Microsoft Office
   - UNA Disability Support Services
2. **Privacy Policies**
   - Canvas
   - Microsoft Office
   - UNA
3. **Institutional Support Services**

   Please visit the Resources for Students. to connect with other UNA resources. The offices described and linked from this page are waiting to help you make the most of your UNA experience. This site offers information including but not limited to the Registrar's office, Financial Aid, Healthcare, Career Planning and Development and Student Engagement.

XVII. TITLE IX