Course Description
Capstone course that guides student in development of an integrative project that demonstrates achievement of learning outcomes in the mathematics major.
This is a fully online, eight-week course. We will not meet face-to-face at any time.

Course Prerequisites
Student must have completed all other required courses in the mathematics major.

Program Outcomes
Mathematics is both a symbolic language and a way of thinking. A universal science and a key component of a liberal arts education, mathematics is a critical tool for technological advancement and practical problem-solving in a complex natural and social world. The major provides training in logic and critical thinking, and helps students gain a mastery of calculus, algebra, geometry, statistics, and computer programming. Grades are prepared for a wide range of careers including teaching, computer science, engineering, finance, actuarial science, business, investments, behavioral sciences, and research.

Cognitive Learning Outcomes
To demonstrate intellectual growth and competence through the Mathematics Major, students will:

1. Acquire, comprehend, organize, and apply knowledge within the major area.
   a. Define basic mathematical terminology within various subject areas and demonstrate an understanding of this terminology.
   b. Comprehend the logical structure of mathematics.
   c. Comprehend the axiomatic approach to mathematics and the real number system.
   d. Acquire and apply a conceptual and procedural understanding of the following sub-areas of mathematics:
      i. Number sense
      ii. Patterns, algebra and functions
      iii. Geometry, measurement and spatial visualization
      iv. Data, statistics and probability
      v. Trigonometry and the conceptual foundation of calculus
      vi. Mathematical structure and logic
   e. Comprehend the history and development of mathematics.
f. Identify various areas of mathematics (discrete, analysis, algebra, geometry, statistics) and the mathematicians who worked within those areas.

2. Analyze and evaluate knowledge within the major area.
   a. Demonstrate computational skills using elements of the real number system.
   b. Collect, organize and evaluate real number data.
   c. Demonstrate computational skills in numerical and non-numerical (word) problem solving.

3. Solve problems presented by the major field.
   a. Form logical hypotheses and complete a logical argument with emphasis on the process.
   b. Determine what type of proof is appropriate for the given problem.
   c. Write logically consistent proofs in the form of mathematical induction and deduction (contra-positive, indirect, direct).

4. Demonstrate oral and written competence in the major field.

   Affective Learning Outcomes

   To demonstrate personal growth through the Mathematics Major, students will:

5. Describe the significance and value of the major in meeting the needs of the global community.
   a. Develop and articulate a statement of values or code of ethics related to the major that reflects one’s respect for different ideas, peoples, and cultures, and an understanding of the responsible uses of technology.
   b. Demonstrate an understanding of the major in relation to its potential for service to the individual, community, and society.

6. Exhibit behaviors indicative of continued learning in the field.
   a. Continue personal and professional development by reviewing current literature, participating in associations, or sharing knowledge and experience with others.

   Required Text

   No text required

   Course Assignment Descriptions

   You will have several opportunities to demonstrate your knowledge and understanding of the principles taught in this course. The primary means of evaluating your work will be through practical application of the material. In the event that you have difficulty completing any of the assignments for this course, please contact your instructor immediately. Please refer to the Weekly Materials section of the cyberclassroom for complete details regarding the activities and assignments for this course. The following is merely a summary.
**Discussion contributions (160 points)**  
(six postings per week @ 20 points per week)

**Initial Substantive Posts**: Submit an initial response to each of the prompts provided each week by your instructor. Your initial post should be substantive (approximately ½ of a page in length) and must be posted by midnight, Central Time by Wednesday of each week. In your substantive post you are encouraged to use references (you may use your textbook); show evidence of critical thinking as it applies to the concepts or prompt and/or use examples of the application of the concepts to work and life. Proper punctuation, grammar and correct spelling are expected. Please use the spell-check function.

**Required Replies**: You must reply to at least two different peers per prompt. Your replies should build on the concept discussed, offer a question to consider, or add a differing perspective, etc. Rather than responding with, "Good post," explain why the post is "good" (why it is important, useful, insightful, etc.). Or, if you disagree, respectfully share your alternative perspective. Just saying "I agree" or "Good idea" is not sufficient for the posts you would like graded.

**Posting Guidelines**: Overall, postings must be submitted on at least two separate days of the week. It is strongly recommended you visit the discussion forum throughout the week to read and respond to your peers’ postings. You are encouraged to post more than the required number of replies.

(Please review the Policies section of Blackboard for further details.)

**Learning Outcome Reflections (4 @ 30 points each = 120 points)**

Write a 2-3 page reflection on how your learning experiences throughout the mathematics program meet the given cognitive and affective learning outcomes in the program. Describe specific concepts you have learned, assignments or exams you have completed, and real world application activities you have done in order to meet the learning outcomes listed for each specific reflection.

**Integrative Project (300 points total)**

Your major project for this course is to create a finished product that demonstrates some of the main ideas you have learned throughout the mathematics program while also applying to your future plans for continuing education or career prospects. Your project will be presented in a web-based format, but you will have some options regarding the content of your project based on what you plan to do after completing your degree. Specific options of free applications that you can use to create a website will be provided for you.

You will be creating a website based on one of the following options (the descriptions below are overviews – additional details will be provided in the weekly lessons):

**Option 1: Mathematics Unit Plan**

If you are planning to become a math teacher, you may want to choose this option that allows you to develop a unit plan for a specific secondary mathematics unit that you may teach in a middle school or high school setting.
Your unit plan should contain 8-10 lessons on the secondary math topic you have chosen.

**Option 2: Career Applications Website**
This option gives you an opportunity to apply various mathematical concepts to a career path or several different career paths that interest you. You will create a website that demonstrates how mathematical concepts in various content areas (algebra, geometry, calculus, etc.) relate to specific careers.

**Option 3: Specific Math Topic Website**
For this option, you will create a website that demonstrates a specific mathematical concept. You will include types of problems that relate to this topic, instructions for solving those problems, worked out examples, additional practice problems for the viewer to try, links to multimedia, and real-world applications for the topic.

The completion of this project will take place in the following steps (details for each step will be provided in the weekly lessons):
- Week 2: Project Proposal (10 points)
- Week 4: Home Page and Navigation (40 points)
- Week 8: Final Project (250 points)

**Course Schedule At-A-Glance**
Please refer to the Term Calendar in our cyberclassroom for specifics regarding dates.

<table>
<thead>
<tr>
<th>Week</th>
<th>Readings &amp; Activities</th>
<th>Assignments Due</th>
<th>Date/Time Due**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning Outcome Reflection 1</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 2</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Project Proposal</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 3</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning Outcome Reflection 2</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 4</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Home Page and Navigation</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 5</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning Outcome Reflection 3</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 6</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
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<td></td>
<td>Learning Outcome Reflection 4</td>
<td>Sunday at midnight</td>
</tr>
<tr>
<td>Week 7</td>
<td>Readings provided in weekly lesson</td>
<td>Course Discussion</td>
<td>Midnight CT on Weds/Sun.</td>
</tr>
</tbody>
</table>
*All online weeks run from Monday to Sunday, except the last week, which ends on Saturday. **All assignments are due at midnight Central Time. (All submissions to the Blackboard system are date/time stamped in Central Time).

### Assignments At-A-Glance

<table>
<thead>
<tr>
<th>Assignment/Activity</th>
<th>Qty.</th>
<th>Points per week</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weeks 1-8: Discussion</td>
<td>-</td>
<td>20</td>
<td>160</td>
</tr>
<tr>
<td>Weeks 1, 3, 5, &amp; 6: Learning Outcome Reflections</td>
<td>4</td>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>Week 2: Project Topic Proposal</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Week 4: Project Home Page and Navigation</td>
<td>1</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Week 8: Integrative Project</td>
<td>1</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>TOTAL POINTS</td>
<td></td>
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<td><strong>580</strong></td>
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*Please refer to the Policies menu for more information about our Course Discussions.

### Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 to 100%</td>
<td>522-580</td>
</tr>
<tr>
<td>B</td>
<td>80 to 89%</td>
<td>464-521</td>
</tr>
<tr>
<td>C</td>
<td>70 to 79%</td>
<td>406-463</td>
</tr>
<tr>
<td>D</td>
<td>60 to 69%</td>
<td>348-405</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60%</td>
<td>&lt; 348</td>
</tr>
</tbody>
</table>

To access your scores, click on Grades in the Student Tools area in Blackboard.

### Important Policies

All course-specific policies for this course are spelled out here in this syllabus. However, additional university policies are located in the Policies section of Blackboard. You are responsible for reading and understanding all of these policies. All of them are important. Failure to understand or abide by them could have negative consequences for your experience in this course.

### Editorial Format for Written Papers

All written assignments are to follow the APA writing style guidelines for grammar, spelling, and punctuation. This online course includes information regarding the APA style under “Writing and Research Resources” in the Resource Room on the course menu in Blackboard.

### Ottawa Online Late Policy

With instructor approval, assignments may be accepted for up to one week after the due date, but a minimum automatic deduction of 10% of the points will be assessed. The instructor also has the option of increasing this deduction percentage up to a maximum of 20%. Extenuating circumstances may be determined on rare occasions and an extension allowed without a deduction, but only at the sole discretion of the instructor.

Discussion board postings will not be accepted for credit when posted after the close of the discussion week. There are no exceptions to this rule; however, solely at the
discretion of the instructor, the student may be allowed to submit an alternative assignment to make up for the points under extenuating circumstances. If granted, this should be an exception to the rule.

No assignments will be accepted after the last day of the course (end of term) unless arrangements have been made and "approved" by the instructor at least one week in advance.

**Saving Work**
It is recommended that you save all of your work from this course on your own computer or flash drive. The capstone course you take at the end of your program may require you to have access to this work for culminating assignments and/or reflections.

**Academic Integrity**
Plagiarism and cheating will not be tolerated at any level on any assignment. The reality of cyberspace has made academic dishonesty even more tempting for some, but be advised that technology can and will be used to help uncover those engaging in deception. If you ever have a question about the legitimacy of a source or a procedure you are considering using, ask your instructor. As the University Academic Council approved on May 29, 2003, “The penalty for plagiarism or any other form of academic dishonesty will be failure in the course in which the academic dishonesty occurred. Students who commit academic dishonesty can be dismissed from the university by the provost/director.”

Please refer to Academic Honesty in the Policies section of the online course menu for important information about Ottawa University’s policies regarding plagiarism and cheating, including examples and explanations of these issues.

**Student Handbook**
Please refer to your student handbook for all university regulations. The Resource Room on the course menu in Blackboard contains information about where to find the student handbook online for your campus.

Please see Policies in Blackboard for additional university policies.

**Blackboard Technical Support**
The Resource Room in Blackboard contains links to student tutorials for learning to use Blackboard as well as information about whom to contact for technical support. Ottawa University offers technical support from 8 a.m. to midnight Central Time for all students, staff, and faculty at no cost. See www.ottawa.edu/ouhelp for contact information.

**Ottawa University Mission Statement**
The mission of Ottawa University is to provide the highest quality liberal arts and professional education in a caring, Christ-centered community of grace which integrates faith, learning and life. The University serves students of traditional age, adult learners and organizations through undergraduate and graduate programs.