



## SYLLABUS

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| <b>Course Title</b>                                                     | Problem Solving                                                                                                                                                                                                 |
| <b>Course Number</b>                                                    | MTH 107                                                                                                                                                                                                         |
| <b>Number of Credits</b>                                                | 3 semester credits                                                                                                                                                                                              |
| <b>Course Dates</b>                                                     | 10/12/20 - 12/12/20                                                                                                                                                                                             |
| <b>Instructor</b>                                                       | Susan Hertzler                                                                                                                                                                                                  |
| <b>Email Address</b>                                                    | susan.hertzler@doane.edu                                                                                                                                                                                        |
| <b>Office Hours/Availability</b>                                        | See "Phone Number"                                                                                                                                                                                              |
| <b>Phone Number</b>                                                     | 402.560.8560<br>In the event you need to contact me please send me a text message identifying yourself and your needs. In most cases I'll get back to you within 24 hrs. Leaving a voicemail is also an option. |
|                                                                         |                                                                                                                                                                                                                 |
| <b>Textbook Information:<br/>(e.g. title, edition, publisher, ISBN)</b> | N/A                                                                                                                                                                                                             |
| <b>Additional Course Materials</b>                                      | <b>Optional</b> items you might find helpful:<br>-graph paper<br>-colored markers or pencils<br>-four function calculator (most smartphones will suffice)                                                       |
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| <b>Course Description</b>                                               | This is a basic problem-solving course suitable for students in any major. A survey of a wide variety of problem solving strategies.                                                                            |

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|                                            | Students successfully completing this course will effectively communicate mathematically, utilize various strategies in analyzing problems, and increase problem-solving persistence and sharpen problem-solving skills.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Foundational Area of Knowledge</b>      | <p>Foundational Area of Knowledge: Mathematical Reasoning</p> <p>Students will work to:</p> <ul style="list-style-type: none"> <li>• analyze and model mathematical situations using a variety of techniques to solve problems effectively</li> <li>• communicate a clear understanding of conclusions</li> <li>• apply mathematical systems of thinking</li> </ul>                                                                                                                                                                                                                                                                                                                                                     |
| <b>Course Learning Outcomes/Objectives</b> | <p>Problem solving is a very important part of learning mathematics. Good problem solving skills don't necessarily come naturally but can be taught. Students need many opportunities to practice problem-solving strategies, and they need to learn how to choose an appropriate strategy to solve a given problem. This course is designed to give students a firm problem-solving foundation. It also teaches them to think and work together, present solutions orally to the whole class, and write up detailed solutions. In other words, it helps to prepare them for life, as well as for future mathematics courses. Hence, written and oral communication skills are an important emphasis of the course.</p> |
| <b>Course Prerequisites</b>                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Instructional Details</b>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Technology Requirements</b>             | <a href="https://www.doane.edu/faq/minimum-computer-requirements">https://www.doane.edu/faq/minimum-computer-requirements</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Course Schedule

| Week or Module | Topic                     | Content                                                                                                                        | Assessments Matched to Learning Outcomes                                                                     | Due Date & Time                                               |
|----------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| 1              | Drawing Diagrams          | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | <ul style="list-style-type: none"> <li>• Copied as presented</li> <li>• 7 problems of your choice</li> </ul> | <p>Session 1<br/>End-of-Class</p> <p>Session 2<br/>by 6pm</p> |
| 2              | Systematic Lists          | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | <ul style="list-style-type: none"> <li>• 7 problems of your choice</li> </ul>                                | <p>Session 2<br/>End-of-Class</p> <p>Session 3<br/>by 6pm</p> |
| 3              | Eliminating Possibilities | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | <ul style="list-style-type: none"> <li>• 7 problems of your choice</li> </ul>                                | <p>Session 3<br/>End-of-class</p> <p>Session 4<br/>by 6pm</p> |
| 4              | Look For Patterns         | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | <ul style="list-style-type: none"> <li>• 7 problems of your choice</li> </ul>                                | <p>Session 4<br/>End-of-class</p> <p>Session 5<br/>by 6pm</p> |
| 5              | Guess & Check             | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be</li> </ul>                        |                                                                                                              | Session 5<br>End-of-class                                     |

|   |                   |                                                                                                                                |                             |                                                         |
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|   |                   | solved in small groups                                                                                                         | • 7 problems of your choice | Session 6 by 6pm                                        |
| 6 | Subproblems       | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | • 7 problems of your choice | End-of-Class<br><br>Session 7 by 6pm                    |
| 7 | Working Backwards | <ul style="list-style-type: none"> <li>• In-class example</li> <li>• In-class problems to be solved in small groups</li> </ul> | • 7 problems of your choice | End-of-Class<br><br>Session 8 by 6pm                    |
| 8 | FINAL EXAM        | <ul style="list-style-type: none"> <li>• 14 Qstns</li> <li>• 7 Strategies</li> </ul>                                           |                             | Session 8 End-of-class<br><br>Session 8 by End-of-class |

#### Grading Assessments

| Type of Assessment                           | Points                                        | Total possible points                                                                                                                                                      |
|----------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Journal Response                             | 20 points                                     | <b>20 Points</b>                                                                                                                                                           |
| Weekly Assignments<br>(7 Problems @ session) | 10 points/per problem = 70 points/per session | 70 points per session times 7 sessions = <b>490 points</b><br><br>*Any problems successfully completed above and beyond the assigned number of problems will be taken into |

|                                                    |                       |                                                                              |
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|                                                    |                       | consideration if a final percentage grade is close to the next letter grade. |
| Final Exam<br>(*7 Problems - Quality vs. Quantity) | 70 points/per problem | <b>490 Points</b>                                                            |
|                                                    |                       |                                                                              |
| TOTAL POINTS POSSIBLE                              |                       | <b>1000 Points</b>                                                           |

#### Grade Scale

A+ = 97-100%    A = 94-96%    A- = 90-93%    B+ = 87-89%    B = 84-86%    B- = 80-83%  
 C+ = 77-79%    C = 74-76%    C- = 70-73%    D+ = 67-69%    D = 64-66%    D- = 60-63%  
 F= 59% or below

|                               |                                                                                                                                                                                                                                                                                                                                                                               |
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| <b>Participation Policy</b>   | <p>Students are expected to be prompt and regularly attend on-ground classes in their entirety. Regular engagement is expected for on-line courses. Participation in class discussions is an integral part of your grade.</p> <p>In the event that you have two absences you will need to reschedule this course when you're able to attend at least 7 of the 8 sessions.</p> |
| <b>Study Time</b>             | <p>Expectation of the amount of time the course requires students to spend preparing and completing assignments. Typically, students could expect to spend approximately 12 hours a week preparing for and actively participating in this 8-week 3 credit hour course. This actual time for study varies depending on students' backgrounds.</p>                              |
| <b>Late Work</b>              | <p>In the event that an emergency arises and you are unable to complete/turn in your work when it is due please contact instructor <b>as soon as possible</b>.</p>                                                                                                                                                                                                            |
| <b>Submitting Assignments</b> | <p>Outside of class assignments will be due by the beginning of the next class meeting.</p>                                                                                                                                                                                                                                                                                   |

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| <b>Communication Policy including Assignment Feedback</b> | <p>Completed, outside of class assignments will be gone over at the beginning of the next/subsequent class meeting - some exceptions apply. Generally, said assignments will be turned in, scored, recorded and returned to students by the end of the class that the work was turned in. Appropriate oral and/or written feedback will be given as well.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Academic Integrity Policy</b>                          | <p>Doane University expects and requires all its students to act with honesty and integrity and respect the rights of others in carrying out all academic assignments. Academic dishonesty, the act of knowingly and willingly attempting or assisting others to gain academic success by dishonest means, is defined in four categories:</p> <ol style="list-style-type: none"> <li>1. Cheating - "Intentionally using or attempting to use unauthorized information or study aids in an academic exercise."</li> <li>2. Fabrication - "Intentional and unauthorized falsification of invention or any information or citation in an academic exercise."</li> <li>3. Facilitating Academic Dishonesty - "Intentionally or knowingly helping or attempting to help another to commit an act of dishonesty," and/or coercing others to do the same.</li> <li>4. Plagiarism - "Intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise," in both oral and written projects.</li> </ol> <p><i>Gehring, D., Nuss, E.M., &amp; Pavela, G. (1986). Issues and perspectives on academic integrity. Columbus, OH: National Association of Student Personnel Administrators</i></p> <p>For more information on the sanctions for academic dishonesty, please visit the website:<br/> <a href="https://catalog.doane.edu/content.php?catoid=16&amp;navoid=1333">https://catalog.doane.edu/content.php?catoid=16&amp;navoid=1333</a></p> |
| <b>Academic Support</b>                                   | <p>Please contact academicsupport@doane.edu<br/> <a href="https://www.doane.edu/graduate-and-adult/academic-support">https://www.doane.edu/graduate-and-adult/academic-support</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Disability Services</b>                                | <p><a href="https://www.doane.edu/disability-services">https://www.doane.edu/disability-services</a><br/> Doane University supports reasonable accommodations to allow participation by individuals with disabilities. Any request for accommodation must be initiated by the student as soon as possible. Each student receiving accommodations is responsible for his or her educational and personal needs while enrolled at Doane University.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Military Services</b>                                  | <p><a href="https://www.doane.edu/graduate-and-adult/military">https://www.doane.edu/graduate-and-adult/military</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| <b>Anti-Harassment Policy</b>  | <a href="http://catalog.doane.edu/content.php?catoid=5&amp;navoid=452">http://catalog.doane.edu/content.php?catoid=5&amp;navoid=452</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Grade Appeal Process</b>    | <a href="http://catalog.doane.edu/content.php?catoid=5&amp;navoid=238">http://catalog.doane.edu/content.php?catoid=5&amp;navoid=238</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Credit Hour Definition</b>  | Doane University follows the federal guideline defining a credit hour as one hour (50 minutes) of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks (one semester), or the equivalent amount of work over a different time period (e.g., an 8-week term). This definition applies to courses regardless of delivery format, and thus includes in-person, online, and hybrid courses (combination of in-person and online). It also applies to internship, laboratory, performance, practicum, research, student teaching, and studio courses, among other contexts. |
| <b>Syllabus Changes</b>        | Circumstances may occur which require adjustments to the syllabus. Changes will be made public at the earliest possible time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Doane Syllabus Addendum</b> | Each student is responsible for being aware of the policies, resources, and expectations as specified in the Doane Syllabus Addendum located at <a href="https://www.doane.edu/Syllabus">https://www.doane.edu/Syllabus</a> .                                                                                                                                                                                                                                                                                                                                                                                                                               |