

Course Syllabus

[Jump to Today.](#)

 [Edit](#)

TMath 342 Spring 2023 (SLN 20975)

Contact Information:

- Instructor: Ruth Vanderpool
- Best method to contact: Canvas Discussions
- email rvanderp@uw.edu (<mailto:rvanderp@uw.edu>)
- Social Hours: can be zoom if requested <https://washington.zoom.us/my/rvanderp>
(<https://washington.zoom.us/my/rvanderp>)
 - Tuesday & Thursday 1:30-2:30pm in the Teaching & Learning Quantitative space (SNO 2nd floor)
- website: <http://faculty.washington.edu/rvanderp/> (<http://faculty.washington.edu/rvanderp/>)
- Office: MDS 303C (do not expect me there!!)

Class Time:

- Tuesday & Thursday 10:10-12:10pm in Joy 110
- Zoom links on Canvas Calendar

Course Description:

Generally, topics vary and are chosen from differential topology, knot theory, or algebraic topology.

Applications (such as chemistry, physics, or engineering) will be emphasized throughout the course.

This quarter the focus will be on Topological Data Analysis making use of algebraic topology concepts.

Prerequisites: minimum grade of 2.0 in TMATH 324 although this quarter TMATH 208 or a programming course will suffice.

Course Objectives:

Upon successful completion, students are able to:

- Define and provide examples for basic terms used in the topological area of study.
- Use techniques from the topological area of study to differentiate objects.
- Provide examples that highlight the limits to the techniques above.

- Use topological theorems and tools on problems from another discipline.
- Break down complex problems into manageable pieces and make simplifying assumptions.

This supports the Student Learning Objectives in the Math Major by enabling students to:

- Comprehend, discover, and communicate common principles from algebra, geometry, and analysis,
- Modify problems to make them tractable, and
- Apply quantitative theory, modeling, or mathematical principles to other disciplines to solve problems.

Rights of the Learner

As a student in this class, you have the right:

- to be confused,
- to make a mistake and to revise your thinking,
- to speak, listen, and be heard, and
- to enjoy doing mathematics.

Opportunities for Mastery:

- Daily activities allow interaction with material in low stakes manner.
- Tokens allow for either late Written Homework submission or regrade.
- Your lowest scoring Lab Homework grade will be dropped.
- Scaffolded structure for final project with instructor and peer feedback before final due date.

Required Items:

- Prerequisite Technical Knowledge: General familiarity with computers, email systems, accessing the internet, installing software, and manipulating/digitizing files. General requirements for this class are posted in the [Computer Requirements](https://docs.google.com/document/d/14zc6MFDMUQJkLa_USNusYD6VfoThLsC0Zca5SjucebU/edit) (https://docs.google.com/document/d/14zc6MFDMUQJkLa_USNusYD6VfoThLsC0Zca5SjucebU/edit) page of the Technology Module.
- Jupyter Workbook accessible at: <https://jupyter.rttl.uw.edu/2023-spring-tmath-342-a> (<https://jupyter.rttl.uw.edu/2023-spring-tmath-342-a>)
- Readings will be provided through Canvas and will be a collection of textbook chapters and articles.

Tentative Schedule:

Upcoming due dates for assignments are posted in the "Coming Up" section on the right side of your screen immediately after you log into Canvas. The due dates for the entire course are listed at the bottom of this Syllabus and can also be found on the Calendar link (at the top of this page). Details about

topics to learn, material to review, and projects that need work are posted in weekly Modules (whose link is always available on the left when in the TMath 342 Canvas course) and summarized in the "Objectives & Tasks" page.

Evaluation/Grading:


- 15% Participation
- 25% Written Homework
- 25% Lab Homework
- 35% Project (graded drafts, peer reviews, final poster, etc)

Communication & Netiquette:

<https://docs.google.com/document/d/1rwcQya8ETAHpm2RhsYPGRnJpU3veqRa-3A0M0GJdPZg/edit?usp=sharing>

You are expected to work regularly with others in this class and thus need to make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

General communications policies and netiquette are posted [here](#). 

<https://docs.google.com/document/d/1rwcQya8ETAHpm2RhsYPGRnJpU3veqRa-3A0M0GJdPZg/edit?usp=sharing>

Participation:

Posting attempts/work/answers for problems from activity sheets in the classroom count towards your participation marks. Usually these sheets will not be collected or marked but the group will be asked to post their work & answer to one of the questions on the board. This will allow the class to see the answer as well as other methods to solving problems. (There is always more than one way to find a solution!) Opportunities for these are given most class days and also on Discussion boards following class. You need to collect 5 of these throughout the term.

Written Homework Policies:

In order to understand mathematics you need to do mathematics! Individuals must turn in their own homework weekly on Tuesdays by the end of class on paper or through Canvas. It is encouraged for students to work together on problems but make sure that you write up your own solution and cite who you worked with! Fifteen minutes at the start of class on Tuesday is set aside to provide help or

suggestions for the assigned problems. Late homework will be accepted up until the point that the Instructor begins marking the assignment. Once marking/grading has begun no late homework is accepted unless through the use of a token.

Lab Policies:

Applications focused homework performed in Jupyter Workbooks will be assigned and be due regularly. This applications homework generally focuses on implementing the mathematical concepts in code or on data. This homework is to be completed in groups of 3 to 4 people although I encourage everyone to try the assignments individually as well! Only one lab needs to be submitted for each group, with all the names of the collaborators at the top. Late labs will be accepted up until the point that the Instructor begins marking the assignment. Once marking/grading has begun no late lab work is accepted.

Project Policies:

Beginning in week five, students form groups of 2 or 3 and will apply topological analysis techniques to investigate data and model a given problem. The final product will be a poster presented (for 2 hours) in SAMURS (June 8th 9am-2pm, notice the final exam time for this class is June 8th 10:10-12:10!) Details, including a rubric and due dates for data collection, graded drafts, peer review, and final product will be given in class.

Getting Help: (<https://docs.google.com/document/d/1h-9ks1Rj1AswJswN4qgjn-veRxVH9WkAfS6Cu89JCHY/edit>) Many resources exist, are available, and are intended to help you with math, technology, and personal issues and questions. A few of the most helpful are listed [here](#) (<https://docs.google.com/document/d/1h-9ks1Rj1AswJswN4qgjn-veRxVH9WkAfS6Cu89JCHY/edit>).

General Policies:

(https://docs.google.com/document/d/1FjxC22UgjVM7JT_2e6DHKSpk5ZWdIEVUU34AJhQMhY/edit)

Campus-wide and class policies regarding inclement weather and emergency procedures are posted [here](#) (<https://canvas.uw.edu/courses/603479/wiki/general-policies>).

Course Summary: