

## MATH 498 Undergraduate Research

### (Independent Reading on Catastrophe Theory)

Research meetings will be held weekly on Fridays 4–5pm in Dawson 223 or online

Zoom link for online meetings: <https://nsc-edu.zoom.us/j/82388547394?pwd=YURvUIQwOHNxM0gycHl6VUUwUkNFdz09>

### Instructor's Information

**Name:** Sungju Moon, PhD

**Primary Contact:** Use the [Inbox tool](#) within Canvas.

**Email:** [sungju.moon@nevadastate.edu](mailto:sungju.moon@nevadastate.edu)

\*\*Please note that all official University communication is conducted using NS-issued email addresses (e.g., @students.nevadastate.edu) in order to comply with the Family Educational Rights and Privacy Act (FERPA). If you need assistance finding or accessing your NS email account, please see the relevant section on the [LASB Course Policies and Guidelines](#) page.

**Office Phone:** (702) 992-2725

**Office Location:** Dawson 223

**Office Hours:** Tuesdays 1–2pm, Wednesdays 4–5pm, and whenever my office door is open.

Online meetings on Thursdays and Fridays by appointment

### Email & Classroom Response Time

You can generally expect a response to emails within 24-48 hours (or slightly longer over weekends or holidays). Feedback for completed discussions, quizzes, and assignments depends on the length and complexity of the activity and could take up to 10 days. For questions on the status of a completed assignment, discussion, or test please contact me.

### Course Description

Undergraduate Research in Mathematics in the form of independent reading.

This semester, we will explore René Thom's *Catastrophe Theory* in depth, alongside a broad self-paced introduction to nonlinear dynamics and chaos.

### Required Text(s) & Materials

**Title:** *Catastrophe Theory*

**Author:** Domenico P. L. Castrigiano and Sandra A. Hayes

**Edition:** 2nd

**ISBN:** 0-8133-4125-6

**Title:** *Nonlinear Dynamics and Chaos*

**Author:** Steven H. Strogatz

**Edition:** 3rd (2nd edition would suffice)

## Course Learning Outcomes

After finishing this course, you will be able to:

- Identify the key ideas of Catastrophe Theory
- Pursue further study in Catastrophe Theory independently
- Describe examples of applications of Catastrophe Theory, including their limitations
- Explain the fundamental concepts of Dynamical Systems and Chaos Theory

## Class Schedule

This is a student-driven, self-paced course with no fixed schedule. We will meet at designated times to review and discuss progress in assigned readings.

## Assignment Description & Due Dates

**Independent reading & discussion (100%):** Students will establish their own milestones at the start of the semester and work toward achieving them. Milestones can include, for example, regular reading summaries or introductory presentation at a colloquium. Progress will be assessed based on the effort and outcomes demonstrated in relation to these milestones over the course of the semester.

## Exam Description & Due Dates

This course does not include any exams.

## Late Work Policy & Attendance Expectations

If for some reason you are absent due to an extenuating circumstance or medical situation, please report the incident using the [Student Absence Notification System Links to an external site.](#)(SANS). Instructors will then review the information in the SANS to determine how, or whether it's possible, to address missed or late work.

There may be days you do not to attend classes or leave early due to past or ongoing crises or distressing circumstances. Disclosure of specific reasons or details is not expected, but it will be helpful if you could communicate with me about instances of missed sessions or work; this is because (1) frequent or prolonged inactivity with regard to course contents will negatively impact your learning, and (2) open communication will help us reformulate missed assignments to suit your situation. Missing five consecutive class sessions or assignments without prior or follow-up notice will prompt me to check in with you for a 'pulse check'. Please know that I am available to provide resources and connect you to support services.

## Grading Criteria

(Course Point Totals) – 100%

- Independent Reading & Discussion (100%)

## Grading Scale (Letter Grade and Point Range):

A 93% or higher

A- 90%-92.99%

**B+** 87%-89.99%

**B** 83%-86.99%

**B-** 80%-82.99%

**C+** 77%-79.99%

**C** 73%-76.99%

**C-** 70%-72.99%

**D+** 67%-69.99%

**D** 63%-66.99%

**D-** 60%-62.99%

**F** less than 60%

**Accessing Grades and Instructor Feedback:** To access your grades and find the instructor's feedback, click on Grades in the left menu. Scroll through the list until you find the new graded assignment (indicated by the blue dot to the left of the assignment name). Then click on the assignment name. You will see your grade. Below it you can click on Show Rubric to see the marked up rubric. Click on the paper title if you want to download the original document. (The instructor's marks or comments will not appear on the downloaded document.) Click on the box to the right of the paper title to see the Turnitin report. Click on View Feedback to see the paper marked up with the instructor's comments/corrections in DocViewer. The instructor's feedback is on the right. [Accessing Grades](#) will take you step-by-step through how to find all instructor feedback and see the marked-up paper and rubric.

## Artificial Intelligence (AI) Policy

### WHAT IS AI?

AI tools are applications and other generative technologies capable of producing content (e.g., generating, summarizing), offering feedback (e.g., revising, translating), researching, assisting with coding, or other tasks typically done by humans.

Examples include, but are not limited to, ChatGPT, Grammarly, Bing Copilot, Google Gemini, Grok, Answers.AI, Quillbot, Claude AI, DeepL, DeepAI, DALL-E, etc.

### AI TOOLS BANNED ON STATE-OWNED DEVICES

The [State of Nevada has banned](#) some AI tools (and other technology) due to security or intellectual property concerns. You cannot use these tools on University-owned computers or other devices:

- Grammarly (public version)
- DeepSeek AI

The State updates the banned technology list occasionally, so other tools may be added. You are responsible for checking the most updated list to ensure you are not using any banned tools on state-owned devices.

### AI USE POLICY FOR THIS COURSE

**Prohibited Uses.** As a student in this course, you are not allowed to use AI on assignments in the following ways:

- Writing full essays, discussion posts, reflections, or academic papers
- Generating presentation material or reading notes

**Permitted Uses.** You are allowed to use AI in the following ways:

- Checking grammar and spelling
- Exploring unfamiliar mathematical ideas with a chatbot (with AI attribution)
- Generating basic examples given a theorem or definition (with AI attribution)
- Research assistance or finding sources (with AI attribution)
- Visualizing the flow of ideas (with AI attribution)
- Checking basic logical structure of a proof (with AI attribution)

If you are unsure how AI can be used for a specific assignment, talk to the instructor before you get started

## AI CITATION

This course uses the following citation styles:

### APA Style

OpenAI. (2023). ChatGPT (Feb 13 version) [Large language model]. <https://chat.openai.com>

APA in-text citation: (OpenAI, 2023)

### MLA Style

“Text of prompt” prompt. ChatGPT, Day Month version, OpenAI, Day Month Year, <https://chat.openai.com>

MLA in-text citation: ("Shortened prompt")

## CONSEQUENCES FOR MISUSE

Misuse of AI may result in plagiarism or academic misconduct penalties outlined in the [NS Student Code of Conduct](#) and/or the [LASB Academic Conduct Policy](#) (found under Resources & Policies). Continued misuse of AI in coursework or across courses will result in escalating consequences based on the severity and frequency of the violation, which could include receiving an F in the course, academic probation, suspension, or expulsion.

## LASB Course Policies & Guidelines

All courses in the School of Liberal Arts, Sciences, and Business (LASB) are subject to [LASB course policies and guidelines](#). You are responsible for reading, understanding, and abiding by these policies and guidelines.

## Student Support & Resources

### Academic Success Center (Tutoring)

The [Academic Success Center \(ASC\)](#) [Links to an external site.](#) offers a range of services including free one-on-one and group tutoring sessions where students can review and practice course concepts and relevant study/test taking strategies with trained peer tutors.

**NetTutor Online Tutoring.** Did you know you can receive free on-demand academic support at your convenience when the ASC is closed? You can submit a question or request a drop-in session for a specific subject with an e-instructor. The majority of NetTutor e-instructors have a Master’s or Ph.D. in the field. You can access NetTutor through Canvas by selecting the "NetTutor Online Tutoring" on the left-side navigation bar in each of your courses.

## Writing Center

Supporting every NS student's ability to improve their process and product, the [Writing Center](#) [Links to an external site.](#) provides trained readers for all writers, all projects, in all disciplines, and during all stages.

## Academic Advising Center

The Academic Advising Center is a dedicated team of Advisors committed to your academic success at NS. By providing the right advice and guidance, we help students meet their educational and personal objectives. Please visit [Academic Advising Center](#) [Links to an external site.](#)

## Scorpion Success Network

If the instructor determines your performance in this class is placing you at academic risk, you may be referred to a member of the Academic Advising Center. An Academic Advisor will work with you to address issues and develop a student success strategy. Regardless of whether a referral has or has not been made, you are ultimately responsible for tracking your own progress in this course. If you would like to meet with an Advisor regarding any academic struggles you are experiencing, please contact Academic Advising at 702-992-2160 or at [studentsuccess@nevadastate.edu](mailto:studentsuccess@nevadastate.edu).

## Student Wellness Services

[Student Wellness Services](#) [Links to an external site.](#) If you are struggling with hunger, unstable housing, safety, mental health worries, or ANY other concerns, contact Student Wellness.

Email: [studentwellness@nevadastate.edu](mailto:studentwellness@nevadastate.edu) | Call 702-992-2514 [Links to an external site.](#)

## Disability Resources

At Nevada State University, we recognize our responsibility and embrace the opportunity to meet the unique educational needs of students with documented disabilities. The staff of the [Disability Resource Center \(DRC\)](#) is dedicated to providing a coordinated program of support services for students qualifying with disabilities under the Americans with Disabilities Act (ADA) and Section 504 Guidelines. Our mission is to ensure that all students qualifying with disabilities have equal access to participate in, contribute to, and benefit from all university programs, classes and activities.

Confidential, sensitive, and individualized services are provided free of charge, on a case-by-case basis.

Any student who believes s/he may need accommodations, based on the impact of a documented disability, should contact the DRC Office to speak privately with the Director of the DRC about specific needs. To make an appointment, please contact the DRC office at 702-992-2180 or by email at [drc@nevadastate.edu](mailto:drc@nevadastate.edu).

## Veteran Concerns

If you are a veteran who is struggling academically or have concerns please contact the DRC office at 702-992-2180 or by email at [drc@nevadastate.edu](mailto:drc@nevadastate.edu).