Math 221 | **Discrete Structures** | Spring, 2024

# Syllabus

**Instructor**

Stan Warford
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**Office hours**

Monday, 11:00 – 11:50
Tuesday, 9:00 – 9:50
Thursday 1:00 – 1:50
Friday, 11:00 – 11:50
And by appointment

**Course Web page**

The course Web page will be used to post the assignments and exam dates.
http://www.cslab.pepperdine.edu/warford/math221/

**Objective**

As this course is a continuation of Math 220 the objective is the same. Specifically, the philosophy of this course is expressed well by Robin Milner, the 1992 Turing Award winner, in an interview printed in *Communications of the ACM*, January, 1993:

> The best thing to do, whether you're of a theoretical or a practical bent, is to treat the subject as neither purely theoretical or purely practical. The worst thing you can do is to follow your bent, which would probably be on one of those sides, and ignore the other side. The whole richness of the subject comes from the interplay between practice and theory.
>
> Many will pretty soon find themselves ignoring one of those components because they will naturally become very applications oriented or very basic-research oriented. But the longer we can keep the link between the theoretical frontier and the practical frontier, the better the whole thing will be. We should encourage the next generation to respect that link. If you don't respect that, you lose a whole degree of freedom in the interest of the subject.

Both mathematics and computer science are based on logic as a tool to establish truth through various techniques of proof. The objective of this course is for us to learn formal logic as a theoretical foundation and its application to topics in discrete mathematics and computer science.

**Learning outcomes**

The program learning outcomes (PLO) for the computer science/mathematics major are the ability to:

1. Implement algorithms
2. Prove computational theorems
3. Analyze computational systems
4. Communicate technical results

The course student learning outcomes (SLO) for Math 221, Discrete Structures are the ability to:

Analyze the time-complexity of an algorithm. (PLO 3)
Prove propositional and predicate logic theorems. (PLO 2)
Prove discrete structures theorems. (PLO 2)
Prove the correctness of a program from its formal specification. (PLO 2)

**Required text**
David Gries and Fred B. Schneider, *A Logical Approach to Discrete Math*, Springer Verlag, New York, 1993.

**Required tools**
A 0.5 mm lead mechanical pencil and a retractable white eraser. No ink allowed. Lined paper. Plain paper not allowed. Or, mobile tablet as all homework is submitted electronically on Courses.

**Final grade**
22% Homework
44% Tests (22% each test)
34% Final - cumulative

**Class schedule**
The course web page has the schedule for the homework assignments, which are due twice weekly. The exam schedule is as follows:

Test 1, Monday, February 12
Test 2, Thursday, March 21
Final, Tuesday, April 23, 7:30 a.m. – 10:00 a.m.

**Late homework policy**
Homework is due on Courses at 11:55 pm on the due date. Half credit for homework one assignment late. No credit thereafter. Partial submissions (that is, some problems on time and some others late for half credit) are not allowed. You will receive liberal partial credit, so it is better to turn in an incomplete attempt than to turn in for late credit. Note that your total homework score is equivalent to one test.

**Course evaluations**
Course evaluations are required online near the end of the semester and count as a homework assignment. After you complete the evaluation, email the notice of completion for this course to me.

**Attendance policy**
Attendance is important and may affect your final grade. You are responsible for making sure that your attendance has been recorded. Please provide written documentation for excused absences. There will be no makeup exams. If you miss an exam due to illness or an unexpected major emergency, the final exam score will be substituted for your missed exam score. Doctor's note required for all missed exams.

**Accessibility notice**
Any student with a documented disability (physical, learning, or psychological) needing academic accommodations should contact the Office of Student Accessibility (SAC 105, x6500) as early in the semester as possible. All discussions will remain confidential. Please visit https://www.pepperdine.edu/student-accessibility/ for additional information.

**Academic integrity**
See http://seaver.pepperdine.edu/academicintegrity/ for the academic integrity standards at Seaver College.

**Mission support**

See https://www.pepperdine.edu/about/our-story/mission-vision/ for the mission statement of the university and https://seaver.pepperdine.edu/about/our-story/seaver-mission/for the mission statement of Seaver College. This course supports these mission statements by investigating the truth of its discipline and by preparing students for lives of service to others in the field of computer science.