

Instructor

Stan Warford

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Office hours

Monday, 4:00 – 4:50

Thursday 4:00 – 4:50

And by appointment

Tuesday, 1:00 – 1:50

Friday, 3:00 – 3:50

Course Web page

The course Web page will be used to post the assignments. You are responsible for checking it regularly.

<https://StanWarford.com/FormalMethods>

Objective

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

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

The course student learning outcome (SLO) for Math 220, Formal Methods is the ability to:

- Prove propositional and predicate logic theorems. (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. A scanner app for your phone capable of producing a multiple-page PDF document. Or an electronic tablet.

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, Thursday, September 18

Test 2, Monday, October 27

Final, Monday, December 8, 4:30 p.m. – 7:00 p.m.

Late Homework Policy

Homework is due on Courses by 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

Completion of the online course evaluation is a requirement for this course. They are anonymous and can be viewed by the professor only after final grades have been submitted to the registrar. Email a proof of completion to me before the final exam.

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 Student Accessibility Office (Main Campus, Tyler Campus Center 264, 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 <https://seaver.pepperdine.edu/academics/academic-support/integrity/> 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.