General Information for CS 130

Course number & title: Computer Science 130, *Foundations of Rigorous Thinking*

Class schedule & room: Time: MW 1:30 - 4:00 Room: Link 310 (CS research lab)
A typical class period will consist of a 1½ hour lecture followed by a ¼ hour break and then a ¾ hour cooperative learning session. (do not reduce class time)

Instructor:

Name: Steven Lindell Office: Link 308
Telephone: (610) 896-1203 E-mail: slindell@haverford.edu

Consultation hours: Friday 12:00-2:00

Text: *Logic and Sets for Computer Science*, by Nimal Nissanke, © 1999.

Supplementary reading: *Language, Proof and Logic* by Jon Barwise & John Etchemendy, © 1999.
Predicate logic: the semantic foundations of logic by Richard L. Epstein, © 2001.

Prerequisites: None other than a desire to learn.

Course Description: Develops rigorous thinking skills through the linguistic foundations of mathematics: logic and sets. Emphasis on using symbology to represent abstract objects and the application of formal reasoning to situations in computer science. Designed to serve as a transition course for non-science students who might wish to do further course work in computer or cognitive science.

Class work: The classroom lectures will be integrated with problem-solving sessions which emphasize student participation in a cooperative learning environment. Attendance and participation is a required part of the class grade.

Homework: Weekly or twice weekly assignments. Working together is encouraged. Late assignments will be severely penalized and returned even later. However, if all assignments are turned in, up to two late penalties will be retroactively removed.

Grading:

Learning sessions	10%	(participation and effort)
Homework exercises	30%	(chapter assignments)
Midterm exams	30%	(chapters 1-5; 6-9)
Final exam	30%	(chapters 11-14,15,16)

Rules and regulations: Everything turned in for a grade must be your own work. *Ideas* on how to solve homework problems may be exchanged (orally, or at a chalkboard), but not specific detailed solutions (written on paper). There is no collaboration or help allowed on the examinations. None of this applies to the in-class problem sessions in which collaboration and discussion is encouraged and required!

Special Circumstances: Students who think they may need accommodations in this course because of the impact of a disability are encouraged to meet with me privately early in the semester, and should also contact Rick Webb, Coordinator (rwebb@haverford.edu, 610-896-1290), Office of Disabilities Services to verify their eligibility for reasonable accommodations as soon as possible.

Syllabus

The following course outline is taken from the chapter titles of our book:

1. An overview of logic
2. Propositions and propositional connectives
3. Propositional logic as a language
4. Transformational proofs
5. Deductive proofs
6. Predicates and quantifiers
7. Further predicate logic
8. Interpretation of formulae
9. Proofs in predicate logic (*skim*)
10. Proof by mathematical induction (*skip*)
11. Basic set theoretical concepts
12. Operations on sets
13. Relations: basic concepts
14. Advanced relational operations
15. Properties of binary relations (*optional*)
16. Functions and their classification (*optional*)
17. Numbers (*omitted*)
18. Sequences and bags (*omitted*)
19. Boolean algebra (*omitted*)
20. Lambda abstraction of functions (*omitted*)