The first exam will be in class on Wednesday, February 25. If you have an unavoidable conflict with the date of an exam, please see me as soon as possible (before the exam date!) to discuss options for rescheduling. Last minute rescheduling/extensions will not be accommodated for something known about in advance.

The exam covers material from the first chapter of the text, sections 1.1–1.6. Proof by contradiction and induction will not be on this exam.

The exam is closed book. References for the rules of logic and deduction and the number-related definitions from section 1.6 will be provided — you should be familiar with what they mean and how to use them but you don't need to memorize them.

Many of the questions on the exam will be similar to problems on the homeworks. In particular, you can expect some short proofs, including both a formal proof of the validity of an argument and a more informal mathematical proof. In addition, the exam may include some short answer questions that ask you to define, discuss, or explain a term or other concept.

Terms and ideas that you should be familiar with:

- translations from logic to English, and from English to logic
- proposition; propositional logic
- the logical operators $\wedge$, $\vee$, and $\neg$
- truth table
- logical equivalence ($\equiv$)
- the conditional or "implies" operator ($\rightarrow$)
- definition of $p \rightarrow q$ as $(\neg p) \vee q$
- negation of a conditional: $\neg(p \rightarrow q) \equiv p \wedge \neg q$
- tautology
- Boolean algebra
- the basic laws of Boolean algebra — you do not need to have the laws themselves memorized, but you should be familiar with what they mean and how to utilize them
- logic circuits and logic gates
- making a circuit to compute the value of a compound proposition
- finding the proposition whose value is computed by a circuit
- converse of an implication ($p \rightarrow q$ has converse $q \rightarrow p$)
- contrapositive of an implication ($p \rightarrow q$ has contrapositive $(\neg q) \rightarrow (\neg p)$)
- an implication is logically equivalent to its contrapositive
- predicates; predicate logic
- one-place predicate, two-place predicate, etc
- domain of discourse
- the quantifiers $\forall$ and $\exists$

- the rules of predicate logic — you do not need to have the laws themselves memorized, but you should be familiar with what they mean and how to utilize them
- arguments, valid arguments, and deduction
- premises and conclusion of an argument
- formal proof of the validity of an argument
- how to show that an argument is invalid
- translating arguments from English into logic
- the rules of deduction — you do not need to have the rules themselves memorized, but you should be familiar with what they mean and how to utilize them
- mathematical proof
- direct proof
- existence proof
- counterexample
- the number terminology definitions from section 1.6 (pages 52–53) — you do not need to have the definitions themselves memorized, but you should be familiar with what they mean and how to utilize them