

## **SM291 – Fundamentals of Mathematics – Spring 2005**

Textbook: Ethan D. Bloch, *Proofs and Fundamentals: A First Course in Abstract Mathematics*, Birkhäuser, 2000.

The course will cover most of chapters 1 – 4 of the textbook and other topics at the instructor's discretion.

Chapter 1 – Informal logic: statements, relations between statements, valid arguments, quantifiers

Chapter 2 – Proof techniques: direct proofs, proof by contrapositive and contradiction, cases, if and only if, quantifiers, writing mathematics

Chapter 3 – Sets: basic definitions, operations, indexed set families

Chapter 4 – Functions: definition, image and inverse image, composition, inverse functions, injectivity, surjectivity, bijectivity, sets of functions