

Math 52 Master Syllabus Fall 2011

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Math 52 serves to introduce students to the key principles of higher mathematics, and to the mathematical community at UVM. The prescribed syllabus is limited, allowing each instructor to exercise originality in crafting his or her section of the course. Some explicit goals of Math 52 are that students will learn to:

- 1) Write sound logical proofs on course topics, including proofs by contradiction and by induction.
- 2) Use correct mathematical notation and terminology.
- 3) Distinguish between definitions and theorems.
- 4) Apply general mathematical results appropriately to specific cases.
- 5) Make connections between different branches of mathematics.

The core topics include integers, algorithms, sets, logic, relations (including equivalence relations and equivalence classes), functions, methods of proof, recursion, and modular arithmetic. The instructor should choose a number of additional topics from among enumeration, number representations, introductory graph theory, fractals and chaos, complex numbers, elementary number theory, error-correcting codes, public-key encryption and cardinality. Including other topics of interest to the instructor and/or the class is encouraged.

Course requirements should provide special opportunities for students to interact with the material, fellow students, and/or faculty members through writing, computer work, presentations, team projects, classroom activities, or other means.