
Mathematics 361: Knot Theory

Spring Semester 2008
(4 credits)

Instructor: **Prof. Jorge Alberto Calvo** **office:** Academic Bldg 3054
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Meeting Times: Lecture: MWF 2:10 – 3:10 Academic Bldg 1023
Office Hours: MWF 8:30 – 10:30 or by appointment

Textbook: **Topology Now!**
by R. Messer and P. Straffin (ISBN: 0-88385-744-8)

Prerequisites: Math 310: Algebraic Structures, or permission of the instructor.

Course Description: The geometry and topology of knots, links, surfaces, and three-dimensional manifolds. Topics include: Continuity, topological equivalence, isotopy, Reidemeister moves, colorings, Alexander and Jones Polynomials, Euler characteristic, the classification of surfaces, Polyhedral solids, and Heegaard splittings.

Course Objectives: Topology is a branch of mathematics packed with intriguing concepts, fascinating geometrical objects, and ingenious methods for studying them. In this course, we will cultivate the intuitive ideas of continuity, convergence, and connectedness so that we can quickly delve into knot theory and the topology of surfaces and three-dimensional manifolds. Students in this course should have some exposure to the geometry of objects in higher-dimensional Euclidean spaces together with an appreciation of precise mathematical definitions and proofs.

Assessment and Evaluation: The attached schedule gives a list of lecture topics and reading assignments from the textbook. We will also be reading through three research articles. These are marked as “Special Topics” in the schedule. It is imperative that you do not fall behind in your reading. Your understanding of the course material will be evaluated in weekly problem sets, a midterm exam and a cumulative final exam.

All exercises in the problem sets and exams will be graded based on the following five-point rubric:

- 5** Excellent work; no errors (~A+)
- 4** Good work with minor errors (~A)
- 3** Good work with more serious errors (~B)
- 2** Work reflects large gaps in understanding (~C)
- 1** Incomplete work with large gaps (~D)
- 0** No work, or unrelated work, or illegible

Note that scores of 0 or 1 are **not** considered acceptable.

Grades in the course will be based roughly on the following scheme:

Problem Sets	40%
Midterm Exam	30%
Final Exam	30%

**Academic Honesty
and Cooperative
Work:**

All work in this course must be completed in an ethical and honest manner consistent with the Catholic values of Ave Maria University. In particular, you are allowed to discuss the homework assignments with your classmates and even share hints on what to do, but you will still be responsible for completing the work yourself. This is of special importance since you will be evaluated on the basis of your individual understanding of the material, and will not be allowed to collaborate during exams.

Special Needs:

Any students with disabilities who need special accommodations in this course are invited to share their concerns or requests with the instructor as soon as possible.

Disclaimer:

The instructor reserves the right to change or modify this course and the syllabus for justifiable reasons, subject to appropriate and timely notice to the students enrolled in this class.