Math 291 – Knots, Links and Tangles  
Spring 2005

Required Text: The Knot Book, by Colin Adams
Lecture: PPHAC 112  Time: MWF 12:50-2:00pm
Instructor: Kevin Hartshorn  e-mail: hartshorn@moravian.edu
Class web page: http://math.moravian.edu/hartshorn/math299/
Office: PPHAC 202  Office Hours: TW 2:30-4:00pm, Tu 9:00-10:30am,
or by appointment

Goals and Objectives
I have several main goals in this class:
• That you gain an initial knowledge of the basic tools and ideas used in knot theory.
• That you appreciate both the distinction and the interaction between experimentation, conjecture, and proof.
• That you develop the capacity of using computer software as a research tool.
• That you develop your capacity for technical writing.

To help you meet these goals, and to see whether you have attained them by the end of the semester, I have the following objectives:
• Complete assignments that address both straightforward problems and currently unsolved problems.
• Work through a series of exercises in Knotplot.
• Complete an expository paper on a topic of interest in knot theory.

Homework
Homework will be assigned at least once a week throughout the semester. Homework assignments can be found on the main class web site (listed above). You are more than welcome to collaborate on your homework, but each person must hand in his or her own homework on the date due. Late homework is not accepted. All homework should obey the following guidelines:
Neatness: your work should be clear and easy to read. The problems should be written in the order they were assigned.
Completeness: show your work on all problems. Your homework should demonstrate your knowledge of the material.
Appearance: If your homework has multiple pages, staple them together. Folding the corner or paper-clipping the pages is not sufficient. Your name should appear on each homework.

Knotplot Exercises
I will have you working with the application Knotplot through the semester. While the application is available on campus, you can also download it as freeware on your own computer. It is available for the Windows, Linux, and Mac platforms at the web site http://www.pims.math.ca/knotplot/download.html. There is a general Knotplot site with lots of information and resources at http://www.cs.ubc.ca/nest/imager/contributions/scharein/KnotPlot.html. I recommend you look through that page.

I recommend that you download your own copy to your personal computer. Knotplot lab assignments will be counted as regular homework assignments.

“Unsolved Problems”
Through his text, Colin Adams introduces you to many problems in topology that are currently unsolved. While I don't expect you to solve them yourself, I would like you to take time to experiment with the questions and develop your own feeling about what you think the answer might be, or what some related questions might be. Through the semester, I will periodically require you to hand in a write-up of work on these unsolved problems. In grading the work, I will be looking at the quality of writing and evidence that you have put some serious thought into the question you address.

Details on these assignments will be provided at a later date – responses to unsolved problems will be counted with your
Exams
There will be three exams in the course. At this point, I intend for them to all be take-home exams, but that is subject to change. I plan to give the exams on the weeks of February 7–11, March 14–18, and April 11–15. Details on the exams will be provided later.

Participation
A significant portion of the knowledge you gain in this class will come from reading through the text yourself. To help foster a sense of dialogue, I will want you to regularly submit questions or comments.
Your participation responses will be collected through the course Blackboard page. Your responses here will count toward your homework grade.

Semester Project
There will be a semester project required for this course. Details on the size and scope of the final paper required for this project will be given later. There will be a sequence of assignments involved in completing the project:
• Everyone in the class will need to give two short (10 minute) presentations about some topic of interest in knot theory. At least one of those presentations must be on the topic you ultimately choose for your final project. Details on these oral presentations will be provided as the time draws nigh. At the appropriate time, I will also provide some resources and topic ideas to help you in finding an appropriate subject.
• Everyone will need to submit an initial “paper-start” that indicates the basic theme and structure of your final report.
• In the last two weeks of class, you will need to submit a first draft. A fellow student will referee this first draft. Both your rough draft and your refereeing comments will contribute the project grade.
• Your final draft of the project will be due on the scheduled date and time for the final exam. There will be no final exam for this course.

Absences
Although I will not be taking attendance, I do expect you to come to class for each session. You are responsible for any announcements made in class. If you miss a class, make sure that you find out from me or from a fellow student whether you missed any important information or announcements.
Late work is never accepted. I don’t accept late homework and I don’t give make-up exams. If you expect to miss a class (due to a sporting event or conference or some other activity), let me know ahead of time. Special arrangements can be made for homework and exams if I am alerted before the date. If you miss class due to an illness or other unforeseen emergency, let me know as soon as possible.
The class web page will be updated regularly with any important announcements. However, it is your responsibility to make any deadlines for the course.

Grading Policy
When assigning letter grades, I generally use the following guidelines: 85% or better is an A (+ or –), 65% or better is a B (+ or –), 50% or better is a C (+ or –). Note that these are only guidelines and are subject to change as the course progresses. To determine your numeric grade, I will use the following distribution:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>20%</td>
<td>Homework (average of graded assignments)</td>
</tr>
<tr>
<td>15%</td>
<td>Midterm 1 (Wednesday, February 26)</td>
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<tr>
<td>15%</td>
<td>Midterm 2 (Wednesday, March 19)</td>
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<tr>
<td>15%</td>
<td>Midterm 3 (Wednesday, April 23)</td>
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<tr>
<td>35%</td>
<td>Semester Project (Wednesday, May 14 at 9:00am)</td>
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<tr>
<td>100%</td>
<td>Total possible score</td>
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