MATH 4653 (Elementary Probability), 4 credits
TENTATIVE SYLLABUS-SPRING 2006 as of January 4, 2006

CLASS TIMES: 4:40PM-6:35PM TTh
CLASS LOCATION: VinH 206

TEACHER: Fristedt (pronounced Freested)
OFFICE: VinH 252
OFFICE PHONE: (612)-625-5081
OFFICE PERIODS:

COURSE MATERIALS: The book ‘Introduction to Probability, Second Revised Edition’, by Charles M. Grinstead and J. Laurie Snell is required. This book is written for a two-semester sequence. We will be omitting about half the book. Details of these omissions will be provided later. I suggest that students plan a method for tracking these omissions in an orderly fashion, especially since an omission of part but not all of a particular section will sometimes occur.

Two books are on reserve in the Mathematics Library, VinH 310:

- “Counting and Probability, Third Edition” by Steven Roman
- “The Art of Probability for Scientists and Engineers” by Richard W. Hamming

The first of these two books is one of the books used in Math 1031 here. Its lower-level style makes it a good resource for those who have never had, either in high school or college, an algebra course containing a significant amount of probability. The second book is roughly at the same level as the textbook for Math 4653 and has a similar flavor.

PREREQUISITE KNOWLEDGE: Math 2283 or Math 3283 or equivalent and also Math 2263 or Math 2374 or equivalent; especially important are infinite series, multiple integrals, and careful attention to logical reasoning and the meanings of small words.

EXAMINATION SCHEDULE:

4:40pm-5:40pm Th February 9 (class resumes at 5:55)
4:40pm-5:40pm T March 7 (class resumes at 5:55)
4:40pm-5:40pm Th April 13 (class resumes at 5:55)
4:40pm-6:40pm T May 9 (Final Examination)

Notify me by January 20 about any examination time conflict. See the Spring Semester Class Schedule to identify exactly what constitutes a final examination time conflict. The final examination will be comprehensive with emphasis on the material treated after Test 3 in order to compensate for the fact that that material would not have been tested on one of the first three tests.
RELATIONS AMONG THE SIX COURSES: MATH 4653, 5651, 5652, 5654 and STAT 5101, 5102.

- Math 5651=Stat 5101. In particular, credit cannot be earned for both courses.

- In order to take any one of the courses Math 5652, Math 5654, and Stat 5102, credit in Math 5651=Stat 5101 (or the equivalent knowledge from another institution) is needed.

- Credit can be earned for all three of the courses Math 5652, Math 5654, and Stat 5102.

- Credit cannot be earned for Math 4653 if credit for any of the other five courses has been earned.

- Credit can be earned for both Math 4653 and Math 5651 if taken in this order, and, in this case, both can count toward the total 4xxx-, 5xxx-level mathematics course requirement for undergraduate mathematics majors.

- However, for undergraduate mathematics majors, only one (but any one) of the three courses—Math 4653, Math 5651, and Stat 5101 —can be used to partially fulfill the analysis requirement.

- Math 4653 does not earn credit toward a graduate degree in mathematics. In so far as credit toward a graduate degree in another department is concerned, the decision is up to that other department. Moreover, if that department does want it to earn credit, that department must act affirmatively for it to happen.

- Math 4653 has considerable conceptual overlap with Math 5651 and some with Math 5652. The calculations in Math 4653 tend to be much less involved than those in the two 5xxx-level courses. For this reason, Math 4653 does not in itself prepare a student to take Math 5652, Math 5654, or Stat 5102. Despite a partially different level of calculational complexity in Math 4653 from that in Math 5651, the prerequisites for the two courses are, for good reason, the same. For instance, multiple integrals play a significant role in both courses, but the more advanced multivariable calculus topic of Jacobians plays a much larger role in Math 5651.

One reason that this syllabus is tentative is that I haven’t yet confirmed with the mathematics office that the above points about the six courses are accurate.
HOMEWORK SCHEDULE: Due at beginning of class on:

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HOMEWORK RULES: Homework for submission should be clearly written on 8 by 10.5 (or 8.5 by 11) sheets of paper, using only one side of each sheet of paper. Clarity, neatness, correct reasoning, correct answers, and good judgment about how much detail to include are all important, but neatness does not preclude the clear crossing out of some writing. The pages of homework should be fastened together, preferably with a staple but a paper clip is ok, and should be numbered—for instance, “Page 1 of 3”, “Page 2 of 3”, “Page 3 of 3”. Also, the name of the student should appear on every page.

The maximum possible gross score on each homework assignment is 25 points. The best 7 of 9 homework assignments will contribute to the gross homework score—maximum possible equals 175. Division by 5 gives the net homework score (maximum possible = 35), which will be used in the evaluation for the quarter.

You are permitted and even encouraged to discuss problems with classmates, even those problems whose solutions you are asked to submit as homework. However, you are not permitted to look at what a classmate will actually submit, and it is required that the final writing of what you will submit be done without reference to notes taken in such discussions. This rule does not preclude reading those notes with care before beginning your final write-up.

EVALUATION: There are 225 possible points in the quarter: 35 on each of three 50-minute tests, 35 on homework, and 85 on the final examination. There is no set proportion of the various grades which will be earned; it is possible that all will get better than a C+ (and there are also extreme possibilities in the other direction). The grading on tests will take into account the presentation of solutions; clear unambiguous writing in which good judgment has been exercised in deciding what to emphasize is an important aspect of Math 4653.

Missed tests and late assignments (late by no more than one class period) will be handled on an individual basis according to the following guidelines listed in order of decreasing importance: (a) fairness by comparison to those students who have taken tests in a timely fashion and submitted homework on time; (b) convenience to me; (c) reasonableness toward the person who missed a test or submitted a late assignment.

In no case will an ‘I’ be given for a de facto withdrawal even if the student in question plans to take Math 4653 in the future. The appropriate symbol in such a case is ‘W’, a symbol granted and regulated by the various colleges. I have no power to give a ‘W’, so if, at the end of the quarter, I am presented a grade sheet with the name of a student who has stopped participating in the class, my only choice is to give an ‘F’ or ‘N’, depending on type of registration.
The University supplies the following definitions of grades, not refined to account for pluses and minuses:

A: achievement that is outstanding relative to the level necessary to meet course requirements;

B: achievement that is significantly above the level necessary to meet course requirements;

C: achievement that meets the course requirements in every respect;

D: achievement that is worthy of credit even though it fails to meet fully the course requirements;

S: The minimal standard for S is to be no lower than C-. The instructor or department must inform the class of this minimal standard at the beginning of the course. [For registrations in Math 4653 in Spring 2006 on the ‘S to N’ basis, ‘S’ is the equivalent of ‘C-’ or higher and ‘N’ is the equivalent of ‘D+’ or lower.]

F: Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

I (Incomplete): Assigned at the discretion of the instructor when, due to extraordinary circumstances, e.g., hospitalization, a student is prevented from completing the work of the course on time. Requires a written agreement between instructor and student.

The following is another University policy that relates to grades: Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course. (Note: This is not the only University policy related to academic dishonesty.)

Sometimes when tests (and homework) are graded, grading errors are made, say due to some unusual correct approach being used. I am willing to reconsider the scoring of particular problems on tests. For such reconsideration please re-submit the solution booklet to me within three class periods from the day the booklets are returned by me and indicate on the cover the identifying number(s) of the solution(s) which you want me to reread, and possibly include a comment of where you want me to focus my attention in case you think you know of something I have overlooked. In no case will I reconsider regrading when the writer of the solution is standing besides me pointing out what was really intended in the solution. Grading of homework can similarly be reviewed. However, the awarding of partial credit on homework will be at least as stringent as on tests. Two reasons: (1) On homework there is more chance for checking one’s own work than there is on tests. (2) Individual tests count much more than individual homework assignments, so it is better to become familiar with course standards on homework than on tests.
THE COMMENTS THAT FOLLOW ARE EXTREMELY IMPORTANT. IF YOU TAKE THEM SERIOUSLY IT WILL HELP MAKE YOUR EXPERIENCE WITH THE COURSE A SATISFYING EXPERIENCE, AND IT IS ALSO LIKELY TO HELP YOUR GRADE.

For undergraduate courses, one credit is defined as equivalent to an average of three hours of learning effort per week (over a full semester) necessary for an average student to achieve an average grade in the course. For Math 4653, a 4-credit course which meets 4 hours per week, a student should expect to spend an additional 8 hours per week on course work outside the classroom. Moreover, for this effort to have its maximum benefit, it should be spread somewhat evenly over the semester and within each week. Also, there will be some variation from student to student depending on mathematical background and mathematical aptitude. In particular, a student who is taking her or his first 4xxx- or 5xxx-mathematics course or who has not taken prerequisite mathematics in the recent past should probably spend more than the 8 hours per week mentioned above.

I strongly recommend that your first reading of any section in the textbook come before that material is discussed in class, and also that you try some of the non-assigned problems relevant to that material. When the subsequent class presentation follows along the lines of the reading, you may want to take notes sparingly if at all so you can give full attention to thinking and listening. And you may want to take somewhat more extensive notes when the class presentation has a character different from that in the book. A further comment on the note-taking issue will be made in class.

It is wise to make a good attempt at almost all of the problems, especially all those problems that are not similar to other problems in the same section. It is especially important to hone your skills on some of the easier problems before attacking the problems that you are required to submit. Often the total amount of time needed to do two easier problems and then one harder problem that you are to submit is less than what it would be to do the one harder problem only.

One aspect of Math 4653 that will require significant concentrated study is learning to accurately transfer a problem written with little or not symbolism into a symbolic problem that one can solve. For the purpose of enhancing one’s skill for this type of task I strongly recommend conversation with classmates outside of class. For instance, in connection with Problem 10 on page 36, there are four issues: (i) Do I understand the problem? (2) How should I begin? (3) How should I proceed? (4) Do the arithmetic. Task 4 is trivial. The main aspect of the problem is task 2, and the more precisely one addresses it, the easier becomes task 3. But one cannot hope to do well on task 2 without first treating task 1. It is for tasks 1 and 2 that conversations with classmates can be mutually beneficial, especially for developing skills that are transferrable to other problems.

Although attendance does not play a direct role in grading, my experience as a teacher indicates that there is high correlation between attendance and grades. It might happen during the semester that you will feel that a particular class session has turned out to be useless. It would be a mistake to let that experience lure you into intentional absenteeism or late arriving to class.