

**Course Syllabus**  
**MATH M111**  
**Mathematics in the World, Spring 2008**

**Classes:** MW, 1:00pm – 2:15am NS 105  
**Text:** For All Practical Purposes: Mathematical Literacy in Today's World, 7th Edition, Freeman  
**Prerequisites:** MATH-M014 or equivalent, or Level 3 on the Mathematics Placement Examination  
**Instructor:** Dean Serenevy Office: Northside 328 Email: [dean@math.serenevy.net](mailto:dean@math.serenevy.net)  
Web page: <http://dean.serenevy.net/>  
**Office Hours:** TR, 3:00pm – 5:30pm *or by appointment*  
**Calculator:** any basic scientific calculator (with  $\sqrt{\quad}$ , exponents,  $\pi$ );  
**cell phones are not acceptable calculators during tests**

Conveys the spirit of mathematical languages of quantity; students apply concepts from algebra, geometry, management science, probability and statistics, and use scientific software to analyze real world situations. Satisfies LAS Languages of Quantity distribution requirement and General Education requirements for baccalaureate degrees. MATH-M111 grade can replace IU South Bend MATH-M110 grade.

You should plan on spending 2–3 hours working on this course outside of class for every hour of lecture. This is not a passive experience; you must participate actively. One thing you can do to help yourself in this course is to find at least one person with whom you can study. Not only does this help you study better, but also, in the event you miss a lecture, you can get the notes and assignments. Another thing you can do is read the relevant sections of the text book before lecture. Even if you don't understand everything, seeing it once before I explain it will help you follow lecture considerably.

- ★ If you are unclear on something in class, ask a question! ★
- ★ Be actively involved in your education — it is why you are here. ★

**Evaluation** There will be approximately 12 assignments (about 2–3 problems/short write-ups each) that will be collected at the beginning of each week, 3 special projects, 4 tests, and one final examination. The percentage distribution is as follows.

	Assignments	15%
3	Projects	25%
4	Tests	30%
1	Final Exam	30%

Final grades will be assigned according to the following percentage guidelines.

A	93–100%	B	83–86%	C	73–76%	D	63–66%
A–	90–92%	B–	80–82%	C–	70–72%	D–	60–62%
B+	87–89%	C+	77–79%	D+	67–69%	F	0–59%

**Office Hours** Please come to my office hours for help. This gives me the opportunity to focus on specific problems you may be having and to explain things in a more personal manner. If the scheduled times are bad for you, make an appointment with me.

**Homework and Assignments** I will assign homework exercises on a more or less daily basis. I will collect around 2–3 problems, which will occasionally include a brief written component, each Monday to be graded. You should do all assigned work (not just those to be turned in) for the following reasons. First, it has been my experience that if you do not do the homework, you do not learn the material. Second, most test questions will be very similar to those assigned. We will spend the first few minutes of each class answering questions from the homework.

**Group Study** Group study is encouraged.

However, assignments and projects must be completely written by the individual handing in the assignment unless explicitly assigned as a group project (in which case each group will turn in a single copy). Assignments not assigned as a group project which were written “as a group” will not count for credit. This includes identical copies of the same written report as well as the case where each report is a modified version of some common base report or base outline.

**Late Policy** All Assignments are due at the beginning of class on the day they are due. Assignments must be turned in at the beginning of class to qualify for full credit. Assignments received in afternoon of the day they are due will automatically be docked 1 point. For each additional day the assignment is late (non-class days included) an additional point will be docked.

**Tests** The tests will be taken in class and will be closed book and closed notes. If you have a conflict with any of the test dates, make alternative arrangements with me beforehand. I will only consider make-ups in extreme situations. Note that these dates are tentative. I reserve the right to make changes (announced in class) to the test schedule if I find it necessary.

**Exams** The final exam will be comprehensive. Our final exam is scheduled for Wednesday 30 April at 1:00pm in our regular classroom. If you will not be able to attend the final exam at this time you must notify me at least 30 days prior to the exam.

**Extra Credit** Extra credit will be made available throughout the semester. Extra credit problems will have due dates and will **not** be accepted late. You may also create your own extra credit. If you have an idea of something you would like to do, let me know. Extra credit projects are graded more strictly than normal course-work and will usually require a 2–3 page writing component which will be graded using the same standards as in a standard composition course. All extra credit work must be completed and turned in by the last day of class. **No extra credit work will be accepted the day of the final.**

**Grading Criteria for Written Work** Writing projects need to be neat, clear, and well explained. Projects will need to be typewritten on  $8\frac{1}{2}'' \times 11''$  paper, but math formulas, computations, and diagrams should be written in neatly by hand. Written work will be graded on three criteria.

- Mathematical Correctness — correctness of mathematical claims and computations
- Mathematical Clarity — clarity of explanation of mathematical reasoning and problem-solving logic
- Written Clarity — clarity of expression, logical ordering and arrangement of paper components

**Technical Writing** Here are several points to bear in mind about writing essays (whether in mathematics or in other subjects).

- All the rules and advice you have learned over the years about good writing apply to technical writing as well as to other forms of prose. It is often more difficult to express mathematical ideas clearly and precisely, so do not expect these writing projects to be easy.
- Organize, organize, organize! Essays need to have an introduction, a body, and a conclusion. If the work is going to be long, it probably makes sense to have labeled sections covering the different points. Make an outline of what you plan to say, and think a lot about how to order it, both before you start writing and throughout the process.
- Finally, be careful to give credit to the sources you use. Plagiarism (intentional or not) has become a major problem and if you copy material from the Internet or other sources and present it as your own you are stealing another person's work. The consequences can include suspension from school. When in doubt, ask about proper procedures for citations.

The IUSB Office of Student Judicial Affairs has an excellent webpage on understanding and recognizing plagiarism. I recommend that you take their short online test to see if you can properly identify plagiarism. <http://www.indiana.edu/~istd/>

**Tutoring** There is free walk-in tutoring available in the Mathematics Department in room NS 310. Tutoring typically begins within the first few weeks of class. The tutoring center is typically open MTWR from 8–7. This semester's hours should be available shortly and will be posted on the door to NS 310 or on the department webpage <http://www.iusb.edu/~sbmath/tutoring.shtml>.

**Missing Class** If you will be missing any classes due to University activities, you must tell me about these dates at the beginning of the semester. If you have conflicts with test or homework due dates, make arrangements with me beforehand (you can always take a test or turn in homework early). I will only consider make ups in extreme situations.

**Course Coordinator** If you have a concern about the course that can not be resolved by speaking with me, please contact the course coordinator (Yi Cheng, NS 321, 520–4519, [ycheng@iusb.edu](mailto:ycheng@iusb.edu)).

**University Grade Grievance Policy** If a student disputes his or her final course grade, the student must discuss the matter with the faculty member assigning the grade no later than the end of the next regular semester.

If the faculty member disagrees with the student's case for changing the grade, the student may appeal to the chairperson of the department that offered the course. If the chairperson disagrees, the student may appeal to the dean or program director of the area that offered the course. If the faculty member, chairperson, dean, or program director all disagree with the student's request, the student may then appeal to the Academic Affairs Committee of the IU South Bend Academic Senate. That committee then makes its recommendation to the vice chancellor for academic affairs, who makes a final resolution.

In those instances where either the faculty member, chairperson, dean, or program director supports the student's appeal, the student and the person supporting the appeal must submit (to the Office of the Registrar, Administration Building 166) a written appeal to the Academic Affairs Committee of the IU

South Bend Academic Senate. That committee will review the appeal and make a recommendation to the vice chancellor for academic affairs, who makes a final resolution.

**Accommodations for Religious Observances** If any student will require academic accommodations for a religious observance, please provide me with a written request to consider a reasonable modification for that observance by the end of the second week of the course. Contact me after class, during my office hours, or by individual appointment to discuss the issue. If after discussion we reach no consensus, either party or both should seek the advice of the Department Chair or the Dean, and if no consensus is reached, then the advice of the Vice Chancellor of Academic Affairs (“VCAA”). Either the instructor or the student may appeal the VCAA’s decision to the Office of Affirmative Action within ten business days of the determination.

**Americans with Disabilities Act** Any student who feels that an accommodation may be needed based on the impact of a disability should contact Disabled Student Services at 520-4832 in office AL 120 of the Administration Building. Staff will work to coordinate reasonable accommodations for students with documented disabilities. For more information, please visit the web site for Office of Disabled Student Services <http://www.iusb.edu/~sbdss/services.shtml>

**Academic Honesty** As a student you have a right to learn in an environment that provides for intellectual and ethical growth. This is also your responsibility and requires you to behave in an ethical manner. Therefore, your conduct must conform to the Indiana University Code of Student Rights, Responsibilities and Conduct. Please reference the entire code for a complete listing (<http://www.dsa.indiana.edu/Code/>).

#### **Dates of interest**

MON, 7 JAN	Classes Begin!
MON, 21 JAN	Martin Luther King, Jr., Holiday – No Classes
WED, 23 JAN	<b>Test 1</b>
MON, 4 FEB	Last day to Drop/eDrop (5:00pm)
WED, 13 FEB	<b>Test 2</b>
WED, 5 MAR	<b>Test 3</b>
10 MAR – 14 MAR	Spring Break – No classes
MON, 24 MAR	Last Day to Withdraw
MON, 7 APR	<b>Test 4</b>
WED, 23 APR	Last Day of Classes
WED, 30 APR	<b>Final Exam</b> , 1:00pm in our regular classroom

## Tentative Schedule of Topics

Week	Chapters	Topics
Week 1	Ch. 7 Ch. 5	Basics in sampling, bad sampling methods, simple random sampling Experiments and observational study Randomized comparative experiments Displaying data distribution: histograms
Week 2	Ch. 5	Numerically describing center and spreading: mean, median, standard deviation, and quartiles 5-number summary and box-plot
Week 3	Ch. 6	Display relations between two random variables: scatterplot Regression lines. Estimation/prediction based on regression equation Correlation and Least Square Regression
Week 4	Ch. 8	Basic in probability Sample space, events, probability rules, and probability models Equally likely outcomes
Week 5	Ch. 8	Mean of a probability model The law of large numbers Sampling distributions Normal distributions: shape, quartiles, and 68-95-99.7 rules
Week 6	Ch. 8 Ch. 7	Central limit theorem and its application Standard deviation of a probability model Statistical inference, parameters, and statistics
Week 7	Ch. 7	Estimating with confidence Confidence intervals for population proportions and margin of error Confidence intervals for population means
Week 8	Ch. 1	Basics of graphs: vertices, links, valences Euler circuits and Euler theorem Chinese postman problem (TSP), circuits with reused edges
Week 9	Ch. 2	Travelling salesman problem, Hamiltonian circuits Strategies for solving TSP: tree-diagrams, nearest-neighbor algorithm
Week 10	Ch. 2	Sorted-edges algorithm Minimum cost spanning trees and Kruskal's algorithm Tasks and order-requirement digraph Critical path and least completion time
Week 11	Ch. 3	Scheduling tasks, list-processing algorithm Critical-path schedules
Week 12	Ch. 3 Ch. 18	Decreasing time schedules, independent tasks and their scheduling Geometric similarity, The language of growth, enlargement, and decrease Scaling real objects and solve the problems of scaling
Week 13	Ch. 19	Golden ratio Balance in symmetry Analyzing patterns
Week 14	Ch. 4	Introduction of mixture problems One product, one resource Mixture charts, resource constraints and feasible sets
Week 15	Ch. 4	Optimal policy and corner point principle Two products and one resource Two products and two resources