Math 1001 Excursions in Math Section 001 (4 cr)

Meeting Time: MWF 8:00–9:05am in Sci 2200
Instructor: Barry McQuarrie
Office: Science 1380 (by exit to parking lot behind science building)
Office Hours:
Email: mcquarrb@morris.umn.edu (preferred communication) Phone: (320) 589–6302 (I do not use voicemail)
Course moodle site: https://ay15.moodle.umn.edu/course/view.php?id=9694
(the site is accessible from your MyU)

Course Prerequisites: High School Math

To succeed in this course you will need to have completed two years of high school math.

Learning Objectives

This course provides an overview of mathematics as used in our society. A student who successfully completes this course will

- gain proficiency with mathematical models relating to a wide spectrum of real life situations, including scheduling, the traveling salesman problem, and personal finance,
- be able to critically assess these models, the assumptions inherent in the models, and their applicability to different situations,
- understand basic statistics and probability,
- understand symmetry, and identify symmetry in the world around them,
- understand tiling, and construct simple tilings,
- understand basic fair division procedures, and
- use a spreadsheet to analyze data and understand personal finance and other mathematical ideas.

Time Commitment

University policy says "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". Our course is a four-credit course, meeting approximately three hours per week: 4 credits times 3 hours/week/credit - 3 hours/week in lecture = 9 hours/week outside class. Thus, you are expected to spend 9 hours per week working outside of class, reading the textbook and working problems.

Please make the most of my office hours! The content of the course can be difficult at times and I expect to see you all in my office at some time or other. To get the most out of the course you should

- do homework every day,
- allot time to think about what it is we are doing,
- discuss the techniques we are studying and their implementation with your classmates,
- discuss any difficulties with me during office hours.

Textbook

The textbook for the course is *For All Practical Purposes,* 8th or 9th Ed., COMAP. The bookstore will have the latest edition, and the course calendar is based on the 9th Edition. The differences between the editions is usually minimal, but if you use an earlier edition be aware that some of the sections may be numbered differently, content may be slightly different, and problems listed as practice may not line up with your older edition. This is a very good book, in my opinion, but it certainly contains far more material than we will cover in this class. To be prepared for the lectures you should read the section the lecture is on before the lecture is given. I will typically not be able to cover everything from the section in the lecture, but I will indicate what material you are responsible for from each section.

Course Components

The course is hosted on a moodle site, and organized by week. For each topic you have a few days to learn the material and ask questions. **Due dates are on the moodle site as well as the syllabus; make note of them at the start of the semester.**

Ungraded Practice. On the course moodle site I suggest practice homework problems for each topic. You should do as much extra practice as you deem necessary to enhance your understanding of a topic. Falling behind in this course, as in any university course, can lead to disaster, so it is important that you keep up with the material. Practice problems are not graded.

Moodle Quizzes There will be moodle based quizzes related to the readings.

Brain Builders. In class I will hand out short Brain Builders, which are exercises based on some of the concepts we are studying. Sometimes these Brain Builders will be completed and turned in during class, sometimes I will let you take them home and turn them in the following class.

Assignments. Assignments will involve more complex problems than on the Brain Builders. Assignments will be handed out in class, and collected in a later class.

I am demanding that solutions be written up well. This means solutions should be a self-contained document. They should be written legibly, contain diagrams or tables where appropriate, and should state the problem and explain the solution. Interspersing English sentences which explain what you are doing can help in this regard. With its worked-out examples, the book provides many examples of a good solution. To say it a different way, solutions with totally correct computations lacking in necessary good explanations will tend to receive 85%, not 100%.

Excel. Excel is a component of some assignments, and each student will create their own Excel-based solutions when these are asked for and upload them in moodle as part of their solution. Basically, you should not work two people to one computer–if two people are working on separate computers they can talk with each other if they get stuck, but each person creates their own solution, and that is what I want. **Do not leave copies of your assignments on public computers! Copy them to your own disk and then delete them from the Recycle Bin before you leave a public computer.**

Tests. Each unit has a unit test, which will contain some true/false, multiple choice, and short answer questions. You will not be allowed any outside material on your desks during these exams. You will need a calculator that can do exponents ($2^3 = 8$ for example) for some of the problems on the tests (cell phone calculators are not allowed, so borrow a calculator if you don't have one). Debriefing after tests should be done during office hours, after you have had a chance to reflect on the exam. The final unit test is scheduled during the final exam period, but it will only cover material from the fourth unit and be similar in length to the previous unit tests.

Textbook. The book presents the material we will be learning in an organized and comprehensive way. You should try to understand the main point of a given section before coming to the corresponding class.

Class periods. It is important that you attend lectures because announcements regarding the class (upcoming tests, take-home assignments, brain builders, etc.) will be made in class, and assignments are due in class. **If you miss a lecture it is your responsibility to find out what you have missed–start by looking at the course moodle site. Assignments will be available in the Assignments Folder.**

Grading

The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following:

A A−	4.000 3.667	Represents achievement that is outstanding relative to the level necessary to meet course requirements
B+ B B−	3.333 3.000 2.667	Represents achievement that is significantly above the level necessary to meet course requirements
C+ C C−	2.333 2.000 1.667	Represents achievement that meets the course requirements in every respect
D+ D	1.333 1.000	Represents achievement that is worthy of credit even though it fails to meet fully the course requirements
S		Represents achievement that is satisfactory, which is equivalent to a C- or better

The grade for the course will be calculated by the following formula (there is no extra credit):

Brain Builders (completed in class, about 13 total)	10%
Moodle Reading Quizzes (due most Fridays at 8am)	10%
Assignments (Feb 1, 8, 15, 29, Mar 9, 30, Apr 6, 11, 27, May 6)	40%
Unit Tests (Feb 17, Mar 11, Apr 13, May 12 (the May 12 test is at 1:30pm))	40%

Your numerical grades will be converted to letter grades and finally Grade Points via the following cutoffs (grades are not rounded up):

Numerical	95.0%	90.0%	87.0%	83.0%	80.0%	77.0%	73.0%	70.0%	65.0%	60.0%	Below 60.0%
Letter	A	A−	B+	B	B−	C+	C	C−	D+	D	F
Grade Point	4.000	3.667	3.333	3.000	2.667	2.333	2.000	1.667	1.333	1.000	0.000

A Healthy Learning Environment

- **Attendance.** Attendance does not count towards your final grade, but missing class means you don't get the benefit of what we do in class, so please come to class and make sure to be in class on time. Neither I nor your fellow classmates enjoy the disruption late arrival causes. I know that situations crop up that will entail late arrival (please come even if you are late!) but try to ensure it is the exception and not the rule. Buy an alarm clock with a battery backup, as the power often goes out for a moment in Morris. If you are coming from another class and fear you may be late often, just let me know and don't stress about it. If you need to leave class early, let me know before class and slip out as unobtrusively as possible.
- **Computers/Cell Phones.** During class, cell phones and music devices should be turned off, and headphones removed from ears. If I find you are surfing the internet during class I will ask you to leave.
  http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html

- **Personal Conduct In Class and Online.** Be mindful of your peers around you, and keep stray chatter in class to a minimum. In the discussion forums and email communications, please consider the tone of your writing. We must maintain a respectful, open environment if we hope to have effective forum discussions. Also, make sure to use correct grammar, spelling, and punctuation in all your electronic communications. The UMM Student Conduct Code is available at http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf

- **Academic Dishonesty.** Cooperation is vital to your future success, which ever path you take. I encourage cooperation amongst students where ever possible, but the act of copying or other forms of cheating will not be tolerated. Academic dishonesty in any portion of the academic work for a course is grounds for awarding a grade of F or N for the entire course. Any act of plagiarism (presenting the ideas, words, or work of someone else as your own) that is detected will result in a mark of zero on the entire assignment or test. I will make it clear during class what is appropriate collaboration for each activity, but if you still have questions about what constitutes academic dishonesty, please come and talk to me. UMM's Academic Integrity policy and procedures can be found at www.morris.umn.edu/committees/scholastic/academicintegrity/.

  Academic Dishonesty FAQ: http://www.oscai.umn.edu/integrity/student/index.html

- **Appropriate Student Use of Class Notes and Course Materials.** Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes or other course materials beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. **Students may not distribute instructor-provided notes or other course materials, except to other members of the same class or with the express (written) consent of the instructor.** For additional information, please see:
  http://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

- **Late Work/Missed Exams.** Since the assignments are handed out days in advance, only under exceptional circumstances (which can be officially documented) will I accept late work. You will receive a mark of zero if an assignment is submitted late. **However, please talk with me asap (do not wait until the next class) if you missed turning something in, even if it is after the deadline.** If an assignment is partially complete but you are not granted an extension, still submit the work you have completed so you can earn some partial credit. This is far preferable to earning zero on the assignment by not submitting anything.

  If you are going to miss a test (for a documented reason), let me know in advance so we can work out alternate plans. If you unexpectedly miss an exam/quiz/etc for a documentable reason, get in touch with me asap so we can work out alternate arrangements, or schedule a make-up.

  Assignments are due in class (come to class and turn them in). Slipping assignments into my mailbox or under my office door while I am teaching your course is **severely frowned upon** unless we have agreed that you will be doing this.

- **Your Health.** As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. If you have any special needs or requirements to help you succeed in the class, come and talk to me as soon as possible, or visit the appropriate University service yourself. You can learn more about the range of services available on campus by visiting the website:
  http://www.morris.umn.edu/academicalert/studentresources/

- **Disability Resource Center.** The University of Minnesota Morris is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

  If you have, or think you may have, a disability (e.g., mental health, attentional, learning, autism spectrum disorders, chronic health, traumatic brain injury and concussions, sensory, or physical), please contact DRC at 240 Briggs Library or call 320-589-6178 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

- **Academic Alert.** I am strongly invested in making my best effort to ensure all my students (advisees, students in my classes, students I know through other avenues) have both a positive and productive experience at UMM.

  To this end, I use academic alert periodically throughout the semester to inform students when their academic performance in my class could be improved. These alerts are not a punishment, and not an indication of a student's ability to

be successful in the class–they are meant to give the student and the student's advisor a heads up that there are some areas to work on which can help improve the student's mastery of the material.

If you receive an academic alert from me, stop by my office (if you haven't already) to talk with me about your academic progress in the class to date, and we can discuss if there are opportunities or changes to your study practices that could help improve your understanding of the course material–and ultimately, of course, your grade!

Other Policies

- **Makeup Work for Legitimate Absenses.**
  http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html.
- **Student Conduct.**
  http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf
- **Sexual Harassment.**
  http://regents.umn.edu/sites/regents.umn.edu/files/policies/SexHarassment.pdf.
- **Equity, Diversity, Equal Opportunity, and Affirmative Action.**
  http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf.
- **Academic Freedom and Responsibility.**
  http://regents.umn.edu/sites/regents.umn.edu/files/policies/Academic_Freedom.pdf.

Topics

- Chapter 1 Urban Services
- Chapter 2 Business Efficiency
- Chapter 3 Planning and Scheduling
- Chapter 4 Linear Programming
- Chapter 5 Exploring Data: Distributions
- Chapter 6 Exploring Data: Relationships
- Chapter 7 Data for Decisions
- Chapter 8 Probability The Math of Chance
- Chapter 13 Fair Division
- Chapter 21 Saving
- Chapter 22 Borrowing
- Chapter 23 Economics of Resources
- Chapter 19 Symmetry and Patterns
- Chapter 20 Tilings
- Excel (reference will be a handout)

Course UMM Student Learning Outcomes

Knowledge of Human Cultures and the Physical and Natural World through:

- SLO-1a.(I) Core studies in the liberal arts: mathematics

Intellectual and Practical Skills, practiced extensively across students college experiences, including:

- SLO-2a.(R) Inquiry and Analysis
- SLO-2b.(R) Critical thinking and problem-solving
- SLO-2c.(I) Creative thinking and artistic expression
- SLO-2e.(R) Quantitative literacy
- SLO-2f.(R) Information and technology literacy

An Understanding of the Roles of Individuals in Society, through active involvement with diverse communities and challenges, including:

- SLO-3a.(I) Civic knowledge and engagement–local and global
- SLO-3c.(I) Aesthetic/artistic engagement

Capacity for integrative learning, including:

- SLO-4c.(I) Skills for sustained learning and personal development