MA 104 Quantitative Reasoning and Informed Citizenship

Fall 2007 Syllabus

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Class meetings and location: Monday, Wednesday, and Friday, 11:25 a.m. to 12:30 p.m., Comenius 101

Office hours: Monday, Wednesday, and Friday, 10:15 to 11:15 a.m.; Monday, 2:00 to 3:00 p.m., and by appt.

Textbook: *Quantitative Reasoning: Tools for Today's Informed Citizen* by Sevilla and Somers

Course Content and Organization

The course focuses on building quantitative reasoning skills and learning to construct, interpret, and critically assess numerical arguments in the context of investigating issues, with an emphasis on issues relevant for informed and effective citizenship.

The course is organized in three sections: Numerical Reasoning, Logical Reasoning, and Statistical Reasoning. Specific topics within these sections include: organizing information pictorially using charts and graphs; bivariate data; graphs of functions; multiple variable functions; proportional, linear, and piecewise linear functions; modeling involving linear and exponential functions; logarithmic functions and scientific notation; indexes and rating systems; inductive reasoning; deductive reasoning; decision making; apportionment; measures of center and five-number summary; standard deviation, z-scores, and normal distributions; introduction to probability; conditional probability and tables; sampling and surveys; and general problem-solving techniques.

The class will be a mixture of short lectures, questions and discussion, and classroom activities that you will investigate. The majority of class time will be spent with you working on the activities, so active participation during class meetings is expected from each of you. We will be using the classroom computers in Comenius 101 (which has enough computers for each student to work on his or her own computer) and Microsoft Excel 2007, along with the World Wide Web. Some activities will involve students working together in pairs or small groups and some activities will involve individual work.

Course Goals

In this course, we will develop and increase students' ability to
- formulate, analyze, and solve real problems
- reason quantitatively and make and evaluate numerical arguments
- explain and interpret the results of your analyses
- use technology and internet resources for quantitative analysis

We will also demonstrate the breadth, utility, and interesting analysis involved in using quantitative techniques and reasoning processes.

Assessment

Attendance
Attendance is listed first under assessment because your understanding of the material in this course will be assessed during every class meeting. If you are not in class, you cannot show mastery of the day's work during that class. In addition, this course is about participating in applying quantitative analyses to a variety of contexts, not just learning facts and algorithms. Because we will be working with Excel in class and introducing new skills each day, it is very important for you to be there. It will be extremely difficult to catch up once you have fallen behind. Thus, *attendance is required.* Each unexcused absence will adversely affect your class participation grade. Please talk to me in advance if you must miss class for some reason beyond your control. Students are responsible for all work covered in class and all assignments, even if you must be absent from class. Also, common courtesy demands that you be on time for class and do not leave the room during class (unless you are ill). This will help you, your classmates, and your professor focus on what we all came to do.

Readings and uncollected homework
Daily reading and problem assignments from the text will be given; you are expected to come to class prepared to explain problem solutions and to ask questions on anything that is unclear. You may be randomly called on to answer questions on the readings for that day.

Activities and projects
The reading assignments are background materials for the in-class activities we will be doing. Your work on activities that were investigated in class will normally be collected during the next class. This will give you time to complete an activity outside of class if you didn't finish it during the previous class period. You will be asked to turn in the whole activity, with each part completed, accompanied by any printed graphs and explanations as instructed. All verbal responses are to be completed using full sentences that clearly answer the question. Please proof-read all written explanations to make sure they say what you want them to say. These activities will be graded and returned to you in a timely manner. In some cases the whole activity will be graded; in other cases, portions of the activity will be graded. The points assigned for each activity will vary, but will normally be between 10 and 20 points. In the interest of fairness, late activities will not be accepted.

There will also be several activities that could be called projects. For these activities, you will be able to choose a context that might be of special interest to you. You will be given details about these assignments in class, and will draw on our class work to complete it.

Students are encouraged to study together but each of you must write your own hand-in work individually unless otherwise instructed in writing. The Academic Honesty Policy guidelines for Mathematics courses, which are attached, are to be followed on all assignments.

Quizzes and exams
There will be three short quizzes, two exams, and a cumulative final exam. You will have a half hour to complete each quiz. The quizzes will be given at the end of class on **Friday, September 14; Friday, October 19; and Friday, November 30**. You will have the whole class period to work on the in-class exams, which will be given on **Monday, October 1** and **Monday, November 12**. Please mark these dates on your calendar. No make-up quizzes will be given; make-up tests will be given only under extreme circumstances and with appropriate documentation. (Again, this is a fairness issue; it is really impossible to construct fair make-up quizzes and exams for a class like this one.)

Technology

You will use the classroom computers and Microsoft Excel 2007 during many class periods. Instructions will be provided as needed, so no prior knowledge of Excel is assumed. If you have an earlier version of Excel on a personal computer, you may use that to finish activities and projects. Instructions to complete the activities using an earlier version of Excel are also available. There are sufficient computers available on campus that you do not need access to your own computer to complete the work of the course.

You will need a basic calculator to use when solving homework problems, and to use during quizzes and exams. You will **not** have access to Excel or the computer during quizzes and exams, and you may **not** use a calculator on a cell phone during quizzes and exams.

Grading

Your grade will be based on class participation (15%); three in-class quizzes (10% total); two in-class exams (10% each, for a total of 20%); a cumulative final exam (20%); and graded activities, projects, and other homework (35%).

Extra help

You are encouraged to see Dr. Somers for extra help during office hours or to arrange an appointment for extra help, if needed.

General recommendations for success

- Be on time for class and stay focused on the work of the class during the entire period. (Temporarily forget about text messages, e-mail, other coursework, and so on.)

- Keep a reliable record of all assignments, including when they are due and if they are to be collected or not.

- Prepare for each class by completing the reading assignments. When you read, read with pencil or pen and paper in front of you, and take notes, work out examples, and write down your questions.

- Keep an organized three-ring binder that contains all completed activities, quizzes, exams, and other course material, including your notes taken during class and your notes on the readings.

- Complete assigned activities and work on the ungraded explorations as they are assigned.

- Find one, two or more students from the class with whom to discuss the course material outside of class.

- Come see me for help whenever you have unanswered questions.

Possibility of changes

The dates, policies and course requirements stated in this syllabus are subject to change in the event of unforeseen circumstances.

Accommodations

Any student who wishes to disclose a disability and request accommodations under the Americans with Disabilities Act (ADA) for this course first must meet with either Mrs. Laurie Roth in the Office of Learning Services (for learning disabilities and/or ADD/ADHD) or Dr. Ronald Kline in the Counseling Center (for all other disabilities).

ACADEMIC HONESTY POLICY GUIDELINES

MATHEMATICS COURSES

The Department of Mathematics and Computer Science supports and is governed by the *Academic Honesty Policy of Moravian College* as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you <u>must</u> acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources, you will be violating the *Academic Honesty Policy of Moravian College.*   For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by you instructor for a particular test.