MTH 163—Precalculus Mediated learning  
Fall 2003

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Prerequisites: Algebra I, Algebra II, Geometry or Trigonometry and a satisfactory placement test score. Students not meeting the preceding criteria will not have the necessary mathematics background in order to be successful in this course. All students enrolled in Math 163 will be required to take a readiness test at the beginning of the course. Based on the results of this test and other data available to the instructor, students will be advised by the instructor whether or not they should continue in the course.

Description: Math 163 presents college algebra, matrices, and algebraic, exponential, and logarithmic functions.

Objectives: Upon completion of this course the student should be able to:

1. Work with integral and rational exponents.
2. Work with radicals.
3. Simplify algebraic expressions.
4. Demonstrate proficiency with a graphing calculator.
5. Work with algebraic expressions.
7. Be familiar with interval notation.
8. Solve linear equations and applications involving linear equations.
9. Solve absolute value equations and inequalities.
10. Solve non-linear inequalities. (polynomial and rational)
11. Solve quadratic equations.
12. Solve equations which are reducible to quadratic form.
13. Sketch the graph of linear equations.
14. Sketch the graph of polynomial equations.
15. Sketch the graph of rational equations.
17. Determine the domain and range of a function.
18. Evaluate functions.
19. Find the inverse of a one-to-one function.
20. Apply functions.
21. Determine zeros of polynomial functions using synthetic division and rational zero theorem.
22. Do composition of functions.
23. Approximate real zeros of a polynomial function.
24. Identify exponential functions.
25. Apply exponential functions.
26. Convert exponential equations to and from logarithmic equations.
27. Solve exponential equations.
28. Solve logarithmic equations.
30. Solve systems of equations involving second-degree equations.
31. Perform matrix addition.
32. Perform scalar multiplication of matrices
33. Perform matrix multiplication.
34. Find the inverse of a square matrix.
35. Use matrix equations to solve systems of equations.
36. Identify the parts of a parabola
37. Sketch the graph of a parabola.
38. Find the equations of a parabola, given conditions.
39. As 36 for ellipse.
40. As 37 for ellipse.
41. As 38 for ellipse.
42. As 36 for hyperbola.
43. As 37 for hyperbola.
44. As 38 for hyperbola.
45. Perform translation of axes for conics.

**Academic Systems Software:** You will complete Math 163 using the College Algebra software called Mediated Learning Systems from Academic Systems. You will use multimedia computers provided in the lab located in 151 Godbey. This software has been designed to help you advance at your own rate (but still within a time frame) for understanding and applying precalculus. Within each topic there are lessons. You should complete and pass each lesson in order listed in the syllabus. Using this method of learning you must be actively involved in your learning. You are not a “math spectator”!! The instructor’s role will be more that of a coach or mentor.

You may need individual tutoring. The Tutoring Connection has qualified tutors who can work with you on a regular basis.

Keep a notebook and take notes as you work through the problems on the computer. These can be studied later when you do not have access to a computer.

**Attendance:** Attendance will be monitored closely. Class attendance is considered by educators to be essential in learning mathematics. Unless there is an emergency I expect you to be in class. NRCC’s policy states that the instructor may withdraw you if you are absent for the equivalent of two week’s worth of classes; this includes absences due to illness and emergency. (For this 3-day per week class that means 6 classes – not seven!!) Attendance is very important if you wish to be successful in this class. **Do not “cut” 5 times** and then expect leniency on the instructor’s part when you have a real emergency.

The attendance policy is still in effect even if you are working ahead. If you complete all the quizzes, tests, etc. before the end of the semester, then you will be required to take the final exam within one week. It is not until you take the final exam that the attendance policy will not apply to you.
Keep in mind that you might hit a trouble spot somewhere, so you should MOVE AS FAST AS YOU COMFORTABLY CAN, BUT AS SLOWLY AS YOU NEED TO in order to meet the deadlines for the written tests. The written tests and quizzes must be taken on or before the scheduled dates; however, you’ll be free to “work ahead”. If you want to take a test before the scheduled date, you must give me 24-hour notice. The computer Evaluates pertinent to the topics covered on the written tests must be taken prior to taking the written test on the same topics. Otherwise a “0” will be recorded for your score.

****Additional lab hours:**** It will be necessary that you spend additional hours on the computer each week in order to complete the topics on time. Since students progress at different rates, you will need to monitor your progress on each topic using the course and testing schedule that is listed in this handout. For most students it will be impossible to complete the objectives and meet test deadlines without putting in extra computer hours. Allow for this as you evaluate your course and work loads this semester. Coming into the lab an hour before a quiz or test and then trying to “cram in” a topic will only create frustration and low scores on your part.

The lab is open frequently when there is no class in session. In addition, feel free to work there while other classes are in session if a computer is available. And, if you have a computer at home you MAY be able to access the material from home. An “install” diskette is included with your text.

**Tardines:** I expect students to be on time for class and to remain for the entire period. Emergencies that cause occasional tardiness do occur; however, tardiness that is simply a bad habit and evidence of the lack of self discipline will not be tolerated. Three tardies or three “leaving earlies” will count as one absence.

**Lectures:** Remember: the computer is not “teaching” the course. It is simply a tool to be used to facilitate your learning. At various times during the course there will be lectures – some for the whole class and others for subsets of the class. Ultimately, however, YOU are responsible for whether or not you are successful in this course. YOU are in control of your learning environment. At any time that you need additional instruction on a topic it is your responsibility to ask for help.

**Textbook: The Personal Academic Notebook:** You will be required to have the Personal Academic Notebook. These are provided as part of your user fee. Homework is important in this course. Each online lesson has a corresponding lesson in the Personal Academic Notebook. The Notebook Allows you access to the course materials when you are away from the computer. The Notebook contains the following features:

- Topic review
- Summaries of all lesson concepts
- Worked and partially worked sample problems
- Homework problems. **It is imperative that you do the homework problems!**
- Enrichment activities which require you to examine concepts in greater detail or to apply concepts to new situations.
- A lesson practice test which helps you prepare for the final lesson Evaluate (complete solutions to each problem are included.)
- Answers to the odd numbered problems.
- CDs (which you must bring with you to class each day) for the lesson topics*. Also included is an install diskette for use on your own computer. *Replacement CDs for lost or damaged CDs will be available from your instructor for a small replacement fee.
**Graphing Calculator:** A graphing calculator will be required in this course. You are responsible for learning how your calculator works. A class lecture will not be given on the use of the calculator nor will instructions on the use of the calculator be given while you are taking a test or quiz. If you are having problems figuring out how to use your calculator please feel free to see me.

**Headphones:** Since this is multimedia software you will need to supply your own headphones each day. These can be purchased inexpensively. If you already have a set of “walkman” headphones it should be sufficient. You **must** use the headphones while working on the computer. **No headphones – no computer.**

**Grading:** The grade for this course will be derived from five sources:

- Average of computer quizzes (Evaluates) 10%
- Average of written quizzes 10%
- Five written tests 60%
- Final Exam 20%

Notes: (1) All computer Evaluates MUST be taken prior to the written test on that material. If a computer Evaluate has not been taken, then a grade of zero will be averaged.
   (2) The homework assignments SHOULD be done before the quiz on the topic. Homework is due to the instructor before the written test is taken on the material to be counted for the bonus.
   (3) If the school is closed on a quiz/test day, then the quiz/test will be given on the next class day.

**Grading Scale:** Letter grades will be assigned based on your final percentage as follows:

- 90 – 100 = A
- 80 – 89 = B
- 70 – 79 = C
- 60 – 69 = D
- 0 – 57 = F

Note: I do not curve grades. I do not “give” grades. You earn what you get, so plan to work accordingly.

**Tests:** There will be five in class tests each worth 12% of your final grade and a comprehensive final worth 20% of your final grade. No late or makeup work will be accepted. Your final exam may replace your lowest test grade.
Homework: Giving your best effort on homework is the single best thing you can do to help you learn mathematics. As such I will give a 10 point bonus on a test if every problem assigned for that test is handed in or you may receive a 5 point bonus if 75% of the problems are completed.

1. The problems must be in order and fully worked out, not just copy of the answers in the back of the book.
2. The problems must be turned in before the start of the test.
3. The problems must be properly documented – topic number and problem number. Make your work neat and orderly.
4. The problems must be on loose leaf paper and stapled together.
5. No late work will be accepted.

Cheating: The giving or receiving of any help on any graded portion (computer or written) of the course is considered cheating and will not be tolerated. Any student found cheating will receive a grade of “0” on that portion and possibly an “F” for the course. This “0” will not be replaced by the final exam score. When you are doing a computer Evaluate you are not allowed to use your book or notebook.

More Information About Lessons in Academic Systems:

Within each topic there are lessons. Each lesson contains the following 6 modules (See page 6 in your Personal Academic Notebook):

1. Explain- Mathematical concepts and procedures are presented through text, sound, graphics, animations and video. Each “Explain,” includes a short video “(The sections numbered 0.) that illustrates how the concepts in the lesson relate to real-life situations, an explanation of mathematical concepts and procedures that include problems for you to try, and a summary.
2. Apply- This is where your “practice” problems are located. When you need help, you can “link” directly to those pages in “Explain” that teach the concepts or procedures you are practicing.
3. Overview- “(Not included in the E sections) If you feel that you are already familiar with a topic then you can test your skills in “Overview,” which provides a pretest. When you finish the pretest, a customized Learning Plan is developed to help guide and focus your study throughout the lesson so you can spend your learning time most effectively and efficiently.
4. Explore (optional)- This section allows you to investigate mathematical concepts using tools such as the Grapher and the Solver. It reinforces the concepts introduced in Explain and challenges you to extend your knowledge.
5. Homework (See attached schedule for assigned problems.)
6. Evaluate- This is the final lesson quiz and the one that is computed into your final grade for this course. It is designed to be a quick “spot-check” of your understanding of the lesson concepts. It, by no means, is designed to be a complete test of your knowledge. Caution: Good grades on the evaluates do not necessarily mean that you have completely mastered the material. You must do the homework problems. To help you prepare you may want to take the lesson practice tests in the Personal Academic Notebook. You should be ready to complete the Evaluate in the time that you have since you cannot leave in the middle of it. You must score it when you have finished it. After scoring the quiz, review the questions to see where you made mistakes. The written tests are often more difficult than the Evaluates.
How will my instructor monitor my progress in academic systems?

Academic Systems has a very sophisticated management system. You (and your instructor) will be able to print reports at any time that will give information about your progress. You (and your instructor) will be able to see how much time (an on what dates) you have spent on a lesson and which lessons you have mastered. Quiz (Evaluates) scores are also included in the report.

Important Notes:

1. Do not bring friends, relative, or children to the lab with you at any time.
2. Food or drinks are strictly prohibited in the classroom or in the LRC.
3. Make sure that you leave the workstation in proper order when you leave the lab.
4. No person is allowed to work with you while doing computer lessons unless assigned by the instructor.
5. The computers in the lab are for math instructional use only. Students observed playing games or visiting any other sites (including checking e-mail) will possibly lose their computer privileges.
6. Unless there is an emergency do not leave the lab while the class is in session.

Additional Information:

- Any student with special needs or circumstances should feel free to meet with me during office hours.
- I will be happy to schedule a time to help you with this course at times other than my scheduled office hours. The best way to get in touch with me is via email.