

SYLLABUS OF MATH 131-04 FALL 2007
Pre-Calculus for Non-Science Majors (Credit Hrs.: 3.0)
Department of Mathematics, Norfolk State University

Days: Tuesday and Thursday

Time: 8:00 – 9:15 AM

Room No.: BMH A103

INSTRUCTOR: Dr. Ming Fang, Department of Mathematics
(757) 823-8867 Office: BMH B-181 E-mail: mfang@nsu.edu

OFFICE HOURS: MON/WED/FRI 9:00 AM – 10:00 AM
TUE 9:30 AM – 12:30 PM and 2:00 –3:00pm
THU 2:00 PM – 3:00 PM
Also by appointments

COURSE DESCRIPTION: This course is designed to assist students making a transition from elementary mathematics to calculus. The topics include a review of exponents, factoring, linear and quadratic equations, inequalities, functions, graphs, system of equations, exponential and logarithmic functions.

PREREQUISITE: MATH 105 (with a grade of C or better) or Placement Test

COREQUISITE: None

STUDENT RESPONSIBILITIES:

1. The student should pre-study (read) all new topics before the topics are presented in class. The student is expected to complete daily homework assignments before the next class starts. Students are required to get the home assignment checked within a week from the day it is assigned by coming during office hours. The instructor will ascertain the daily progress in accomplishing homework exercises and will devote a portion of classroom activities to the solutions of any troublesome exercises.
2. Students are required to maintain a separate notebook for this course, and all work related to this course must be done in this notebook. They must bring this notebook to every class. Students are expected to devote a minimum of 10 hours per week outside the class. Each student must use a scientific calculator when necessary.
3. Students are strongly encouraged to participate in classroom discussions.
4. Tests will be administered during the course; a mandatory, departmental, comprehensive final examination will also be given. **Students must complete the online lab tests and earn a minimum of 70% on each to become eligible to take the in-class test. A score of less than 70% will not earn any credit. All students must take all lab tests, in-class tests, and the final examination when scheduled.**

NOTE: Any student who does not show up by the third week of classes will be deleted from the roster.

COURSE RATIONALE: It is a required course primarily for non-science majors. The material covers application of mathematics in business. A pre-requisite course for MAT-132 Calculus for non-science majors is needed.

COURSE GOALS and MEASURABLE INTENDED STUDENT LEARNING

OUTCOMES:

Goals: By attending the lectures, completing the assignments, and participating in class, the student should accomplish the following objectives:

- Understand algebraic concepts on a pre-calculus level.
- Analyze and solve problems involving business applications.
- Demonstrate the ability to manipulate formulas and evaluate them on a calculator.
- Realize that algebra is a tool used in higher mathematics.

Measurable Outcomes: Upon completion of the course, the student should have at least level of proficiency of 70% and should be able to:

- Apply the laws of positive and negative integral exponents, the zero-exponent, rational exponents, principal roots, and radicals.
- Rationalize the denominator, and factor expressions completely.
- Discuss equivalent equations and develop techniques for solving linear and literal equations.
- Solve fractional and radical equations.
- Solve quadratic equations by factoring or by using the quadratic formula.
- Model situations described by linear and quadratic equations (business applications).
- Solve linear inequalities with one variable and introduce interval notation.
- Model situations in terms of inequalities (business applications).
- Solve equations and inequalities involving absolute values.
- Understand what a function is and determine domains and function values.
- Recognize constant functions, polynomial functions, rational functions, compound functions, the absolute value function, and factorial notation.
- Combine functions by means of addition, subtraction, multiplication, division, and composition.
- Graph equations and functions in rectangular coordinates, determine intercepts, apply the vertical-line test, and determine the domain and range of a function from a graph.
- Know the shapes of six basic functions and to consider translation and reflection of the graph of a function.
- Develop the notion of slope and different forms of equations of lines.
- Understand the notion of demand and supply curves and linear functions.
- Sketch parabolas arising from quadratic functions.
- Solve systems of linear equations in two variables by using the technique of elimination or by substitution.
- Solve nonlinear systems of equations.
- Solve systems describing equilibrium and break-even points.
- Understand exponential functions and their applications to the area of compound interest.
- Understand logarithmic functions and their graphs.
- Understand the basic properties of logarithmic functions.
- Solve logarithmic and exponential equations.

COURSE MATERIALS/ REQUIRED TEXT / SUPPLEMENTARY READINGS

Text: *Applied Mathematics for the Managerial, Life, and Social Sciences*, 4th Edition
by Tan
ISBN #0-495-01581-4

Additional Materials Required: Recommended Scientific/Graphing Calculator: TI-83.
Class Notebook, and Access account to use “iLrn: ThomsonNOW”
(<http://west.ilrn.com/ilrn/>) for assignments, practice tests and lab test.

Supplementary Material Available: iLrn is accessible via Internet from the official website of Thomson Brooks-Cole Publishing at <http://www.ilrn.com/>. iLrn is an “integrated online suite of services and resources with proven **ease of use** and **efficient** paths to success, delivering the **results** you want.” It includes text-specific tutorials with explanations, examples, step-by-step problem-solving help, practice, and video lessons. Additional resources are also available on the NSU website at <http://www.nsu.edu/>.

iLrn Instructions: Go to <http://www.ilrn.com> iLrn website. Enter relevant information to create an account. Enter the course key [*Enter Course Key Here*] to access iLrn.

PRIMARY METHOD OF INSTRUCTION/METHODS TO ENGAGE STUDENTS: The content of the course is covered in an in-class room lecture setting. Each lecture class covers the theory and related problems from the exercise. For in depth understanding of subject in-class discussions are encouraged. Students are required to solve enough number of problems until they are comfortable with the methods/techniques introduced in the class. It is mandatory to complete the related lab assignment as per calendar supplied with this document. Any difficulties are discussed on one-to-one basis during the office hours. Evaluations are done after sufficient materials are covered, and the graded evaluations are returned to them as a feed back of their performances. Students are required to maintain separate notebook for this course and all work related to this course must be done in this notebook. They must bring this notebook to every meeting – lecture/tutorial or help sessions. Students are expected to devote a minimum of 7 hours per week outside the class.

COURSE OUTLINE/ CALENDAR (Detailed course calendar is attached)

Review	Section 1.1 – Real Numbers	2
	Section 1.2 – Polynomials	7
Chapter 1	Fundamentals of Algebra	
	Section 1.3 – Factoring Polynomials	15
	Section 1.4 – Rational Expressions	21
	Section 1.5 – Integral Exponents	27
	Section 1.6 – Solving Equations	32
	Section 1.7 – Rational Exponents and Radicals	38
	Section 1.8 – Quadratic Equations	46
	Section 1.9 – Inequalities and Absolute Value	56
Chapter 2	Functions and Their Graphs	
	Section 2.1 – The Cartesian Coordinate System and Straight Lines	72

	Section 2.2 – Equations of Lines	78
	Section 2.3 – Functions and Their Graphs	92
	Section 2.4 – The Algebra of Functions	108
	Section 2.5 – Linear Functions	117
	Section 2.6 – Quadratic Functions	129
	Section 2.7 – Functions and Mathematic Models	140
Chapter 3	Functions and Graphs	
	Section 3.1 – Exponential Functions	160
	Section 3.2 – Logarithmic Functions	167
	Section 3.3 – Exponential Functions as Mathematical Models (Exp. Decay)	177
Chapter 4	Exponential and Logarithmic Functions	
	Section 4.1 – Compound Interest	192
Chapter 5	Systems of Linear Equations	
	Section 5.1 – Systems of Linear Equations: An Introduction	252
Chapter 6	Linear Programming	
	Section 6.1 – Graphing Systems of Linear Inequalities in Two Variables	338

RELATED UNIVERSITY-WIDE AND COURSE-SPECIFIC REQUIREMENTS:

- **Writing:** The assessments in this course will include open ended questions to encourage students to master the writing ability in mathematics.
- **Information Technology Literacy:** The student will explore various websites to gain a better understanding of math concepts and problems. The student is also required to do math labs online. Students are encouraged to communicate (outside of the class) with the professor or classmates through electronic means.
- **Quantitative Reasoning:** Most of the math concepts have applications that require quantitative reasoning.
- **Scientific Reasoning:** Most of the math applications require the use of scientific reasoning.
- **Oral Communication:** The student demonstrates oral communication through classroom discussions and explanations at the board.
- **Critical Thinking:** Most of the math concepts and applications require critical thinking.
- **Other Requirements:** The student is required to do the iLrn assignments homework and lab tests for the course.

EVALUATION/ ASSESSMENT METHOD: Students learning evaluations will be done throughout the session at regular interval. Evaluations will include eight lab tests, four in-class tests, homework, pop-quizzes, and a **comprehensive common final examination (compulsory)**. In case of missed test(s) due to excused absences, the final examination will accordingly be prorated. The tests and examinations will be conducted as per following schedule:

Lab Test I: Sept. 10, 2007	Lab Test II: Sept. 16, 2007	In-class Test I: Sept. 17, 2007
Lab Test III: Oct. 3, 2007	Lab Test IV: Oct. 9, 2007	In-class Test II: Oct. 10, 2007
Lab Test V: Oct. 29, 2007	Lab Test VI: Nov. 4, 2007	In-class Test III: Nov. 5, 2007
Lab Test VII: Nov. 21, 2007	Lab Test VIII: Nov. 27, 2007	In-class Test IV: Nov. 28, 2007

GRADING STANDARDS / EVALUATION CRITERIA:

Mid-Term Grade:

Average of four lab tests, Test I, and Test II will determine the mid-term grade.

Final Grade:

Four In-Class Tests	$4 \times 25 = 100$ points
Eight Lab Tests	$8 \times 4 = 32$ points
Homework and Pop Quizzes	= 28 points
Final Examination	= 40 points
	200 points

FINAL EXAM: Thursday, December 7, 2007**10:30 AM – 12:30 PM**

COURSE GRADE EVALUATION: The following grades are guaranteed if you earn the corresponding percentage of the total points by the end of the semester:

59 & below	60-69	70-79	80-89	90 & above
F	D	C	B	A

ACADEMIC INTEGRITY STANDARDS: Further information regarding academic-related conduct, disciplinary procedures, honesty, honor code, violation of integrity (such as plagiarism) and sanctions regarding such misconduct may be obtained by consulting the NSU Student Handbook.

Attendance Policy: Students are expected to attend each class. Attendance will be taken daily. If tardy, please notify the instructor at the end of the class period. Any absence from class doesn't relieve any student of the responsibility for completing all class work and assignments. With satisfactory explanation, an absence may be considered excused. In general, an excused absence will include any kind of illness, participation in university-sponsored activities, recognized emergencies, etc., verified and supported by a written statement from the proper authority. Missing 20% or more of such sessions may result in an automatic failing grade. Those individuals who choose not to show up for class by the end of the third week will be deleted from the roster.

Cell Phone Usage: Students are reminded to turn the ringer off during any formal meeting of the course including class, tutorial, tests, and examination.

TECHNOLOGY REQUIREMENTS: Students are expected to be familiar with usage of TI-83-Plus graphing calculator or a calculator with equivalent capabilities.

AMERICANS WITH DISABILITIES ACT (ADA) STATEMENT: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ADA) of 1990, we ask if you have a disability, please call Ms. Marian E. Sheppard, coordinator at 823-2014 or make contact with the Supporting Students through Disability Services (SSDS) office located in Rm. 240 (2nd Floor)-Assistive Technology Lab, Lyman Beecher Brooks Library.

ACADEMIC SUPPORT SERVICES: Students are encouraged to take advantage of on campus testing and tutoring services. They can use the computers in STARS and ACCESS labs to complete their iLrn home assignments and online labs.

UNIVERSITY ASSESSMENT STATEMENT: As part of NSU's commitment to provide the environment and resources needed for success, student may be required to

participate in a number of university-wide assessment activities. The activities may include tests, surveys, focus groups and interviews, and portfolio reviews. The primary purpose of the assessment activities is to determine the extent to which the university's programs and services maintain a high level of quality and meet the needs of the students. Students will not be identified in the analysis of results. Unless indicated otherwise by the instructor, results from University assessment activities will not be computed in the student grades.

OTHER IMPORTANT DATES:

Aug. 18, 2007:	Classes Begin/Late Registration
Sept. 3, 2007:	Labor Day Holiday (No Classes)
Sept. 6, 2007:	Fall Convocation
Oct. 1 – Oct. 6, 2007:	Mid-Semester Advisory Exam Period
Oct. 12, 2007:	Last Day to Drop a Course
Nov. 22 – Nov. 25, 2007:	Thanksgiving Break
Nov. 30, 2007:	Classes End

FALL 2007 MATH-131 (Pre-Calculus for Non-Science Major) - MWF
TEXT: *Applied Mathematics for the Managerial, Life, and Social Sciences,*
4th Edition by Tan
Laboratory Tests

Student Name: _____ **Instructor:** Dr. Ming Fang

Student ID: _____ **Section:** MATH 131-04

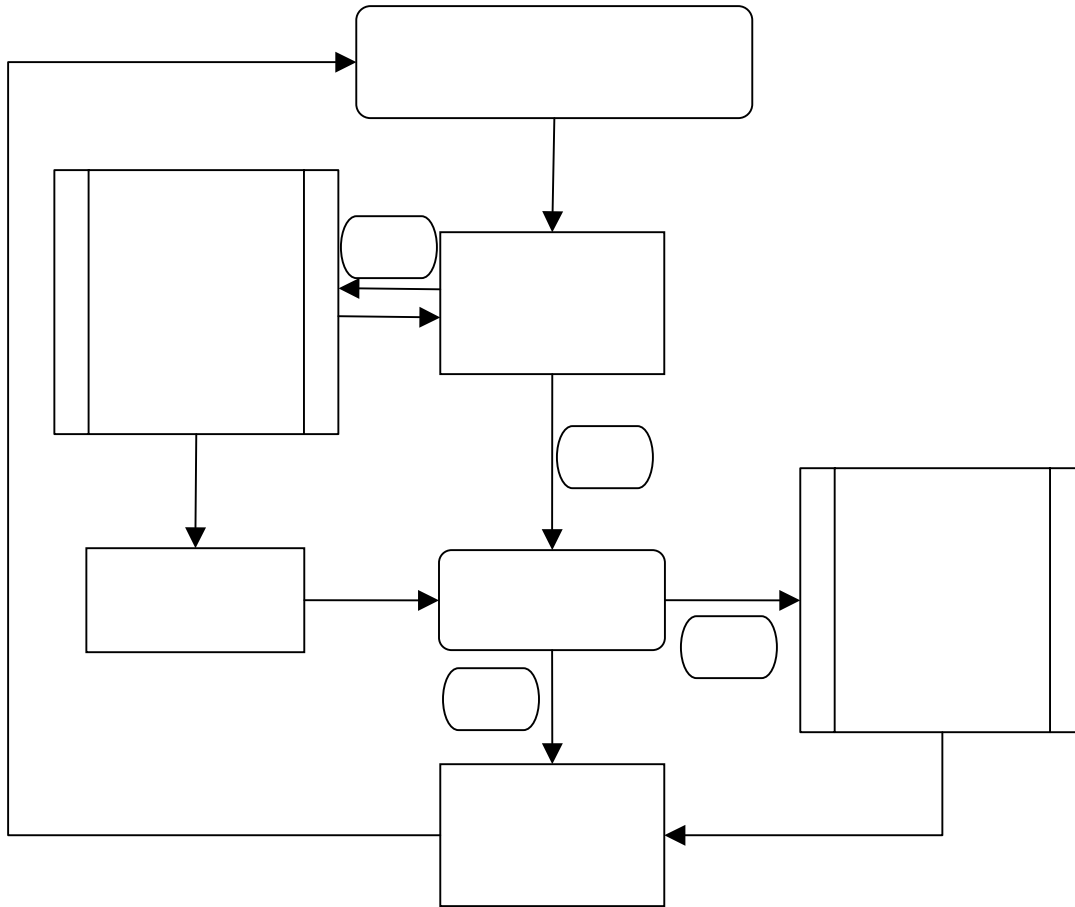
Course Key: E-EZX527GJUYYN

Lab Test	Contents	Due Date
1	Real Number, Polynomials, Factoring Polynomials, Rational Expressions	Sept. 10, 07
2	Integral Exponents, Solving Equations, Rational Exponents, Radicals	Sept. 16, 07
IN-CLASS TEST I: Sept. 17, 2007		
3	Quadratic Equations, Inequalities, Absolute Value	Oct. 3, 07
4	The Cartesian Coordinate System and Straight Lines, Equations of Lines	Oct. 9, 07
IN-CLASS TEST II: Oct. 10, 2007		
5	Functions and Their Graphs, The Algebra of Functions, Linear Functions, Quadratic Functions	Oct. 29, 07
6	Functions and Mathematical Models, Exponential Functions, Logarithmic Function	Nov. 4, 07
IN-CLASS TEST III: Nov. 5, 2007		
7	Exponential Functions as Mathematical Models, Compound Interest	Nov. 21, 07
8	Systems of Linear Equations: An Introduction, Unique Solution, Graphing Systems of Linear Inequalities in Two Variables	Nov. 27, 07
IN-CLASS TEST IV: Nov. 28, 2007		

8 Lab Tests: 16%
Homework/ Pop Quizzes: 14%

4 In-Class Tests: 50%,
Final Exam: 20%

MATH 131
Flowchart



**** No Credit Awarded for Lab Tests not passed.
Lab Tests count for 16% of Final Grade.**

Math 131: FALL 2007 Calendar**

Wk	Day	Date	Topics	Notes
1	1	M 8/20	1.1&1.2 Real Numbers & Polynomials	
	2	W 8/22	Diagnostic Test	
	3	F 8/24	1.3 Factoring Polynomials	
2	4	M 8/27	1.4 Rational Expressions	
	5	W 8/29	1.4 Integral Exponents	
	6	F 8/31	1.5 Solving Equations	
3	--	M 9/3	1.6 Labor Day Holiday	
4	7	W 9/5	1.7 Rational Exponents	
	8	F 9/7	1.7 Radicals	
	9	M 9/10	1.8 Quadratic Equations	Lab Test I Due
5	10	W 9/12	1.9 Inequalities & Absolute Value	
	11	F 9/14	1.3 - 1.9 Cumulative Review	Lab Test II Due (9/16)
	12	M 9/17	1.3 - 1.9 Test-1	IN-CLASS TEST I
6	13	W 9/19	2.1 The Cartesian Coordinate System and Straight Lines	
	14	F 9/21	2.1 The Cartesian Coordinate System and Straight Lines	
	15	M 9/24	2.2 Equations of Lines	
7	16	W 9/26	2.3 Functions and Their Graphs	
	17	F 9/28	2.4 The Algebra of Functions	
	18	M 10/1	2.5 Linear Functions	
8	19	W 10/3	2.6 Quadratic Functions	Lab Test III Due
	20	F 10/5	2.7 Functions and Mathematical Models	
	21	M 10/8	2.1-2.7 Cumulative Review	Lab Test IV Due (10/9)
9	22	W 10/10	2.1-2.7 Test-2	IN-CLASS TEST II
	23	F 10/12	REV Cumulative Review	
9	24	M 10/15	3.1 Exponential Functions	
	25	W 10/17	3.1 Exponential Functions	
	26	F 10/19	3.2 Logarithmic Functions	
10	27	M 10/22	3.2 Logarithmic Functions	
	28	W 10/24	3.3 Exponential Functions as Mathematical Models	
	29	F 10/26	3.3 Exponential Functions as Mathematical Models	
11	30	M 10/29	3.1-3.3 Cumulative Review	Lab Test V Due
	31	W 10/31	4.1 Compound Interest	
	32	F 11/2	3.1-4.1 Cumulative Review	Lab Test VI Due (11/4)
12	33	M 11/5	3.1-4.1 Test-3	IN-CLASS TEST III
	34	W 11/7	5.1 Systems of Linear Equations: An Introduction	
	35	F 11/9	5.1 Systems of Linear Equations: An Introduction	
13	36	M 11/12	5.1 Review	
	37	W 11/14	6.1 Graphing Systems of Linear Inequalities in 2-Variables	
	38	F 11/16	6.1 Graphing Systems of Linear Inequalities in 2-Variables	
14	39	M 11/19	5.1-6.1 Review	
	40	W 11/21	5.1-6.1 Review	Lab Test VII Due
	--	F 11/23	Thanksgiving Holiday	
15	41	M 11/26	QA Question & Answer Session, Make-ups, and Reviews	Lab Test VIII Due (11/27)
	42	W 11/28	Test-4	IN-CLASS TEST IV
	43	F 11/30	QA Question & Answer Session, Make-ups, and Reviews	

** This schedule is subject to change at the discretion of the Instructor depending upon progress of the

class.