

Kent Pearce

Office: Math 201-A

Phone: 742-2566

Office Hours:

Fixed Hours

MW 1:00 - 2:00

TT 11:00 - 12:00

Other Hours

By Appointment

Website:

www.math.ttu.edu/~pearce/courses.shtml

Basic Computer Literacy and
Programming

Math 4371-001

TT 2:00 - 3:20

Class: Math 010

Lab: Math 113

Text:

Project Handouts/Worksheets

Tools:

Calculator, Microsoft Excel,

Maple, WolframAlpha

Purpose: The purpose of this course is to reinforce and strengthen the prospective elementary school (4-8) mathematics specialist's understanding of the basic principles of mathematics and, at the same time, provide them with an introduction to some modern mathematics specific technology which can have an impact on mathematics education at all levels.

The Technology Principle: *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Calculators and computers are reshaping the mathematical landscape, and school mathematics should reflect those changes. Students can learn more mathematics more deeply with the appropriate and responsible use of technology. They can make and test conjectures. They can work at higher levels of generalization or abstraction. In the mathematics classrooms envisioned in Principles and Standards, every student has access to technology to facilitate his or her mathematics learning.

Technology also offers options for students with special needs. Some students may benefit from the more constrained and engaging task situations possible with computers. Students with physical challenges can become much more engaged in mathematics using special technologies.

Technology cannot replace the mathematics teacher, nor can it be used as a replacement for basic understandings and intuitions. The teacher must make prudent decisions about when and how to use technology and should ensure that the technology is enhancing students' mathematical thinking.

NCTM: *Principles for School Mathematics*

Curricular Content:

See addendum

Expected Learning Outcomes: Upon successful completion of this course, students will be able to

- Incorporate technology such as Calculators, Excel, Maple, WolframAlpha, LOGO, and Internet resources, appropriately in their own teaching
- Analyze data using Excel
- Write useful code in LOGO

Assessment of Learning Outcomes:

Assessment will be achieved through one or more activities, non-graded and graded, such as: attendance, class discussion, lab projects, presentations, extra-curricular projects, examinations and other optional activities deemed appropriate by the instructor. It is important to note that these assessments are for your learning benefit. Class grades will be assigned according to the following rubric:

Grading:

Mid-term Exam (18 Oct)	100 pts.
Final Exam (13 Dec)	100 pts.
Lab Projects (9 Projects)	450 pts.
Dates: See Calendar	
Historical Project/Presentation	100 pts.
Statistics Project	100 pts.
Final Project	<u>100 pts.</u>
Grade Total	950 pts.

Grading Scale:

A...100% - 90% B...89% - 80% C...79% - 70% D...69% - 60% F...59% - 0%

Critical Dates:

Monday, 5 September, Labor Day
Monday, 12 September, Last Day for Student-Initiated Drop (without penalty)
Monday-Tuesday, 10-11 October, Student Holiday
Tuesday, 18 October, Mid-term Exam
Monday, 24 October, Mid-semester Grades Due
Monday, 31 October - Last Day for Student-Initiated Drop
Wednesday-Friday, 23-25 November, Thanksgiving Holiday
Wednesday, 7 December - Last day of classes.
Tuesday, 13 December - Final Exam (1:30-4:00)

Notices:

Academic Integrity (Extracted from [OP 34.12](#))

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but is [sic] not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Observance of Religious Holiday (Extracted from [OP 34.19](#))

A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.

Accommodation for Students with Disabilities (Extracted from [OP 34.22](#))

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in West Hall or call 806-742-2405.

Addendum:

Projects/Worksheet Summary

Project #1

Calculations, Arithmetic, Order of Operations, Syntax
Fractions, Exponents, Combinatorics
Tools: Calculator, Excel, Maple, WolframAlpha

Project #2

Floating Point vs Integer Arithmetic
Convert Fractions to Decimal
Convert Decimals to Fractions
Terminating, Repeating
Tools: Calculator, Excel, Maple, WolframAlpha

Project #3

Elementary Number Theory

GCD, LCM, Factor, Relatively Prime, Prime, Composite,

Fundamental Theorem of Arithmetic, , Modular Arithmetic, Divisibility Rules,

Tools: Calculator, Excel, Maple, WolframAlpha

Historical Assignment

Historical Project and Presentation

Project #4

Statistics

Mean, Median, Quartiles, Range, Frequency Distribution, Histogram, Standard

Deviation, Normal Distribution, Sampling, Regression, Scatter Plots, Correlation

Tools: Excel

Project #5

Polynomials

Linear, Quadratic, Cubic, Quadratic, Factoring, Fundamental Theorem of Algebra

Tools: Calculator, Excel, Maple, WolframAlpha

Project #6

Graphing

Polynomials, Rational Functions, Complete Graph, Asymptotes, 3D

Tools: Calculator, Excel, Maple, WolframAlpha

Statistics Assignment

Statistics Project

Project #7

Patterns, Sequences, Limits

Project #8

Calculus

Slope, Tangent Line, Derivative, Graph of Function vs Derivative, Area

Tools: Calculator, Excel, Maple, WolframAlpha

Project #9

Logo

Introduction, Programming, Recursion

Tools: Logo

Final Assignment

Logo and Portfolio Project