

**Texas A&M University - Texarkana**  
**Course Syllabus**  
**Spring 2015**

**Instructor:** Chris Sinuefield  
**Office:** SCIT 104F  
**Office Hours:** MW 12:00 – 1:00 p.m., 3:00 – 4:00 p.m.  
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**Course Number:** MATH2412 (4 semester hours)  
**Course Title:** Pre-Calculus  
**Course Times:** TR 1:00 – 2:30 p.m.  
**Classroom:** UC229

**Text:** *Precalculus: Graphical, Numerical, Algebraic, 8<sup>th</sup> Ed.*, published by Pearson.  
Authors: Demana, Waits, Foley, and Kennedy; ISBN: 9780321656933

**Prerequisites:** Must have satisfied the math portion of TSI and made a requisite score on the Math Placement Exam.

**Required**

**Materials:** 1) TI-84 graphing calculator (*cell phones as calculators are forbidden*).  
2) Access to a mobile device with earbuds would be very helpful, but not essential for success.

**Course Format:** This will be a face-to-face course with the following key elements:

- Student-centered instruction
- Flipped Teaching
- Project-Based Learning
- Student engagement, input, and feedback
- Collaborative Learning Teams/peer partner activities
- Q&A's for homework problems and concept clarification
- Problem-solving strategies

**Catalog Description**

This course provides a rigorous study of the concepts and applications of the fundamental topics of calculus including algebraic functions and their graphs, trigonometric functions and identities, polynomial, rational, exponential, and logarithmic functions, solutions to equations and inequalities, analytic geometry, and polar coordinates. This course is designed to prepare STEM majors for success in calculus. Appropriate computer software and hand held technologies will be utilized.

**Student Learning Outcomes**

The Texas Higher Education Coordinating Board adopted Exemplary Educational Objectives (EEOs) to establish a common knowledge thread through the courses taught within the Texas Core Curriculum. The Mathematics EEOs are integrated into the Student Learning Outcomes below:

- To apply arithmetic, algebraic, geometric, higher-order thinking, and statistical methods to modeling and solving real-world situations.

- To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
- To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- To use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results.
- To interpret mathematical models such as formulas, graphs, tables and schematics, and draw inferences from them.
- To recognize the limitations of mathematical and statistical models.
- To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.

Upon successful completion of this course, students will:

- 1) Demonstrate and apply knowledge of properties of functions.
- 2) Recognize and apply algebraic and transcendental functions and solve related equations.
- 3) Apply graphing techniques to algebraic and transcendental functions.
- 4) Compute the values of trigonometric functions for key angles in all quadrants of the unit circle measured in both degrees and radians.
- 5) Prove trigonometric identities.
- 6) Solve right and oblique triangles.

### Sequence of Material

Week 1-3	1.1 - Modeling and Equation Solving 1.2 – Functions and Their Properties 1.3 – Twelve Basic Functions 1.4 – Building Functions From Functions 1.5 – Parametric Relations and Inverses 1.6 – Graphical Transformations 1.7 – Modeling with Functions 2.1 – Linear and Quadratic Functions and Modeling 2.2 – Power Functions with Modeling 2.3 – Polynomial Functions of Higher Degree with Modeling 2.4 – Real Zeros of Polynomial Functions
Week 4-6	2.5 – Complex Zeroes and the Fundamental Theorem of Algebra 2.6 – Graphs of Rational Functions 2.7 – Solving Equations in One Variable 2.8 – Solving Inequalities in One Variable 3.1 – Exponential and Logistic Functions 3.2 – Exponential and Logistic Modeling 3.3 – Logarithmic Functions and Their Graphs 3.4 – Properties of Logarithmic Functions 3.5 – Equations Solving and Modeling 4.1 – Angles and Their Measure 4.2 – Trigonometric Functions of Acute Angles
Week 7-9	4.3 – Trigonometry Extended: The Circular Functions 4.4 – Graphs of Sine and Cosine: Sinusoids 4.5 – Graphs of Tangent, Cotangent, Secant, and Cosecant 4.6 – Graphs of Composite Trigonometric Functions 4.7 – Inverse Trigonometric Functions 4.8 – Solving Problems with Trigonometry

	5.1 – Fundamental Identities
Week 10-11	5.2 – Proving Trigonometric Identities 5.3 – Sum and Difference Identities 5.4 – Multiple-Angle Identities 5.5 – The Law of Sines 5.6 – The Law of Cosines
Week 12-14	6.1 – Vectors in the Plane 6.2 – Dot Product of Vectors 6.3 – Parametric Equations and Motion 6.4 – Polar Coordinates 6.5 – Graphs of Polar Equations 6.6 – De Moivre’s Theorem and $n$ th Roots 10.1 – Limits and Motion: The Tangent Problem 10.2 – Limits and Motion: The Area Problem
Week 15-16	10.3 – More on Limits Review and Final Exam

The pacing and sequence of material may be altered in the interest of time and to maximize student success.

### Evaluation and Grading

The course grade will be based on accumulated points earned out of total points possible.

Exams – There will be approximately 4-5 exams and a comprehensive final worth approximately 100 points. Any exam missed will be recorded as a zero. A make-up exam will be considered only in the case of an illness which prevented your attendance or some other legitimate reason as determined by me. This must be corroborated by a note from a licensed physician or documentation. *You must contact me before the scheduled examination time in order to be eligible for this consideration.*

Assignments – Individual assignments will be planned throughout the semester worth approximately 20 points. Assignments submitted late will be subject to a penalty.

Group Exercises/Quizzes – Short group exercises and quizzes worth approximately 5-10 points will be assigned and collected during the period to stimulate interaction and reinforce comprehension. They will not be announced in advance and cannot be made up.

Grading Scale:	$90 \leq A \leq 100$
	$80 \leq B < 90$
	$70 \leq C < 80$
	$60 \leq D < 70$
	$F < 60$

### Calculator

Calculators will be used in this class as a teaching tool. They are not simply a device to obtain the answer but as a means of exploring, comparing, and understanding concepts that might otherwise be difficult to visualize. A TI-83 or 84 graphing calculator has been recommended, however, those with a computer algebra system (CAS) will not be permitted for use on tests and quizzes. TI graphing calculators will be available through TAMU-T for student use during this course. Calculators are checked out through the library. You should return the calculator to the library upon completion of the course. *Cell phones as calculators are forbidden.*

### **Academic Integrity**

Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source, constitute academic dishonesty, and may be grounds for a grade of "F" in the course and/or disciplinary actions. For additional information see the university policy manual.

### **Disability Accommodation**

Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

### **Email Usage**

Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. **NOTE:** *Faculty and students are required to utilize the university email account when communicating about coursework.*

### **Drop Policy**

To drop this course after the census date, a student must complete the Drop/Withdrawal Request Form located on the University website (<http://tamut.edu/Student-Support/Registrar/Dropping.html>) or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email [Registrar@tamut.edu](mailto:Registrar@tamut.edu), mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

### **Student Technical Assistance**

Solutions to common problems and FAQ's for your web-enhanced and online courses are found at this link: <http://www.tamut.edu/Training/Student%20Training/index.html>

If you cannot find your resolution there, you can send in a support request detailing your specific problem here: <http://www.tamut.edu/techde/support.htm>

Blackboard Helpdesk contacts:

Julia Allen (main contact) 903-223-3154 [julia.allen@tamut.edu](mailto:julia.allen@tamut.edu)

Frank Miller (alternate) 903-223-3156 [frank.miller@tamut.edu](mailto:frank.miller@tamut.edu)

Nikki Thomson (alternate) 903-223-3083 [nikki.thomson@tamut.edu](mailto:nikki.thomson@tamut.edu)

Office hours are: Monday - Friday, 8:00a to 5:00p

### **Minimum Windows PC Requirements**

- Pentium IV 1.5GHz+ (preferred: Core Duo)
- 1 GB RAM minimum (preferred: 2 GB)
- 128MB Video Card minimum - Sound Card is required for some courses
- 56K modem minimum (Cable or DSL required for some courses)
- Windows 2000, XP, Vista or 7
- Web browser (Internet Explorer 7.0+; Firefox 3.0+)

- Microsoft Word, minimum Office 97
- Some courses will need plug-ins such as Flash player 10 +, QuickTime player 7.0+, Adobe Reader 9.0+, Java Runtime Environment (Java 1.6.0\_15), Windows Media Player 10+, RealPlayer, and Macromedia/Adobe Shockwave.
- Some online courses may also require a CD ROM (8x minimum, higher recommended).
- Blackboard has certified the following browsers for computers running Windows Operating Systems:
  - Internet Explorer 8 or 9 (IE is not supported on Windows XP)
  - Mozilla Firefox 3.6+
  - Google Chrome

#### Minimum Apple Macintosh Requirements:

- Intel Core 2.0GHz+
- 1 GB RAM (preferred: 2 GB)
- 128MB Video Card minimum - Sound Card is required for some courses
- 56K modem minimum (Cable or DSL required for some courses)
- Web browser (Firefox 3.0+ ; Safari 3.0+)
- Microsoft Word, minimum Office 97
- Some courses will need plug-ins such as Flash player 10+, QuickTime player 7.0+, Adobe Reader 9.0+, Java Runtime Environment, RealPlayer, and Macromedia/Adobe Shockwave.
- Some online courses may also require a CD ROM (8x minimum, higher recommended)
- Blackboard has certified the following browsers for computers running Macintosh Operating Systems:
  - Mac OS 10.2 (Jaguar): (Safari 1 is compatible)
  - Mac OS 10.3 (Panther): Safari 1.2 (Firefox 1.5 is compatible)
  - Mac OS 10.4 (Tiger): Safari 2 and Firefox 1.5
  - Mac OS 10.5 (Leopard): (Firefox 2.0 is compatible)

#### I-OS and Android Devices

These devices are currently supported using the Blackboard Mobile App, available for free from your App Store or scan the code below:



To access Texas A&M University - Texarkana, there is an individual license fee of \$1.99 per year or \$5.99 lifetime. This fee gives you access to the university from all your (same platform) devices; it is not necessary to pay the fee for each device you own.

#### Additional Notes

The instructor reserves the right to modify this syllabus at any time as deemed necessary. Any modifications will be announced as soon as possible. The faculty of the College of Science, Technology, Engineering, and Mathematics is committed to the continuous improvement in the quality of instruction. Student input is important and welcomed. Formal assessments will occur at mid-semester and at the end of the course.