Instructor: Ms. Liu  
Class Telephone: (03) 571-7070 #311

Course Description
Welcome to Pre-Calculus! This course builds on and reinforces the topics learned in Algebra 2 with an emphasis on basic function families, transformations, and trigonometry. Matrices and linear systems are extended with the study of Gauss-Jordan elimination. Students are also introduced to polar coordinates, vectors, and sequences and series. Pre-Calculus helps students become familiar with the technical skills and conceptual understanding needed for calculus.

Primary Textbook and Required Materials
2. Notebooks (3), pencil, eraser, loose-leaf paper and graphing paper, folder or binder, and stapler.
3. Graphing calculator (TI-83 Plus, TI-84, or TI-89 are recommended)

Objectives
The learning objectives for this course are based on the National Common Core Standards and the Mathematics Content Standards for California Public Schools.

- Math is the language of science.
- Pre-calculus is foundational math, applied in business, statistics, technology, and science.
  - Calculus is basic to college-level math, science, and engineering...
- Always wonder “why?” and try to find the answer. Could you derive the formulas? What could you apply them for? Math – you can experiment on paper!
- Practice makes perfect! Learn from mistakes.
- Enjoy!

Tips for Success
- Constantly review: Homework, quizzes, and exams are cumulative.
- Practice! Homework teaches problem-solving skills. Expect a *minimum* of 30 minutes per day.
- Take good notes and review at home. Even a 10-minute review makes a difference!

Classroom Behavior Expectations
Failure to comply with the policies may result in parent conferences and/or Administrative referral. Please refer to the Student Handbook for existing guidelines.

1. Be prepared at the bell. Stationary, books, calculator, and homework should be out and ready.
2. Remain in your assigned seat and stay on task.
3. No laptops, cell phones, or another course’s material during class.
4. Raise your hand before speaking.
5. Speak English.
6. Respectfully listen while others are speaking. Be courteous to classmates, faculty and staff at all times.
7. Restrooms are to be used before and after class. If a student needs to leave class, he/she must have a hall pass.
8. Stay in the classroom during breaks.
9. Keep your work area neat and tidy. Pack up your books and stationery, remove eraser crumbs from the tabletops, and push your chair in before leaving your desk.
10. Walk, do not run, in the lab area. Follow directions and ask permission before using classroom equipment.

Course Requirements
1. Students are expected to take notes during class, review notes at home, read the textbook, and work through examples.
2. Keep an agenda book recording assignment due dates, listed on the board and class website.
3. In case of absence, students are responsible for checking the class website for announcements and new assignments, as well as reviewing a classmate’s lecture notes. Missing work must be turned in within one week of the student’s return.
4. An unexcused absence on a test day will result in a loss of 7 points in the make-up test. To be excused from the late test penalty, a note from the doctor or parent/guardian explaining a valid reason for absence is required on the day of return. The make-up test must be taken within one week of return.
5. Homework should be turned in on time, at the start of class. Students whose grades fall below C- or who repeatedly miss homework assignments will be asked to come for extra help at least once per week in the afterschool Advisory Period (3:10~4:10).
6. Academic honesty is expected of all students. Homework must be completed independently.

Grading (Category percents are subject to change.)

Homework 30%
- Due at the start of class. Late work receives a score of zero.
- Completeness and neatness are graded, not just the correct answer. Show work! Derive formulas when necessary, label diagrams clearly, and use proper notation.
- Keep 2 homework notebooks with your grade, name, and class clearly labeled on the front cover. For each assignment, label the homework number, page number, and problem set at the top of the page.
- Loose-leaf worksheets should be stapled and labeled with the appropriate homework number.
- Posters of concepts or word problems, designs, models count as homework.

Quizzes 30%
- Weekly quizzes cover material from the week before (and review topics).
- There will be calculator and no-calculator problems. Calculators may not be shared.
- One lowest quiz grade will be dropped per quarter.

Midterm 10%

Final 10%

Corrections 10%
- Quiz and test corrections are mandatory.
- Correct in a different color pen or on a separate sheet of paper.
- Turn in with the original.
Class Participation 10%
- Class work in student notebooks will be checked for completion.
- This score will be affected by noncompliance with classroom behavior expectations, such as arriving to class late or unprepared, sleeping during or disrupting the lesson.

Bonus Points - available on homework, quizzes, and exams

Course Outline

Chapter 1: Basic Concept Review (4 weeks)
- Algebraic expressions
- Lines, modeling, variation

Chapter 2: Functions in General (3 weeks)
- What is a function?
- Lines and parabolas
- Transformations (translation, reflection, stretching)
- Symmetry, invertibility, periodicity.
- Library of special functions: linear, quadratic, (general quadratic: conic sections), polynomial, rational functions, trigonometric, transcendental functions (exponential and logarithmic, inverse trigonometric).

Chapter 3: Polynomials and rational functions (4 weeks)
- Polynomials (division, root theorems, Fundamental Theorem of Algebra)
- Complex numbers
- Rational Functions (Quotient of two polynomials, Asymptote, Limit)

Chapter 4: Exponential and Logarithmic Functions (3 weeks)

Definition of Trigonometric Functions (2 weeks)
- Right angle trigonometry (6.1~6.3)
- Unit circle trigonometry (5.1~5.3)

Graphing Trigonometric Functions (1 week)
- Trigonometric graphs (5.3~5.4)
- Inverses (5.5, 6.4)

Chapter 7: Trigonometric Identities (3.5 weeks)

Right Triangle Trigonometry and Applications (1 week)
- Standing waves (Ch. 7 focus on modeling)
- Inverses and right triangles (6.4)
- Surveying (Ch. 6 focus on modeling)
- Law of Sines and Cosines (6.5~6.6)

Chapter 8: Polar Coordinates and Parametric Equations (2 weeks)

Chapter 9: Vectors (2 weeks)
- 2D vectors and Dot Product (9.1~9.2)
- 3D if time permits (9.3~9.6)
- Plane curves and parametric equations

Chapter 10: Linear Systems (4 weeks)
- Systems of linear equations
- Matrices, inverses, determinants, Cramer’s rule, Gauss-Jordan elimination
- Partial Fractions
- Systems of inequalities

Chapter 12: Sequences and Series (1.5 weeks)
- Sets, logic, induction (12.5)
- Factoring and the binomial theorem (12.6)
- Arithmetic and geometric sequences and series
• Sigma notation

Chapter 14: Probability (1.5 weeks)
Chapter 11: Conic Sections (2.5 weeks)
• Parabolas, ellipses, hyperbolas review
• Rotation of axes
• Polar equations of conics

ACKNOWLEDGMENT – Pre-Calculus Honors

Print Student Name: ____________________________  Date ________

Please confirm that you have access to http://powerschool.pacificamerican.org/ and
www.oz.nthu.edu.tw/~g9561701. Your signature below verifies that you understand the expectations for
this course.

Thank you for your cooperation and time.
Ms. Liu

Parent/Guardian Signature:  Student Signature: