

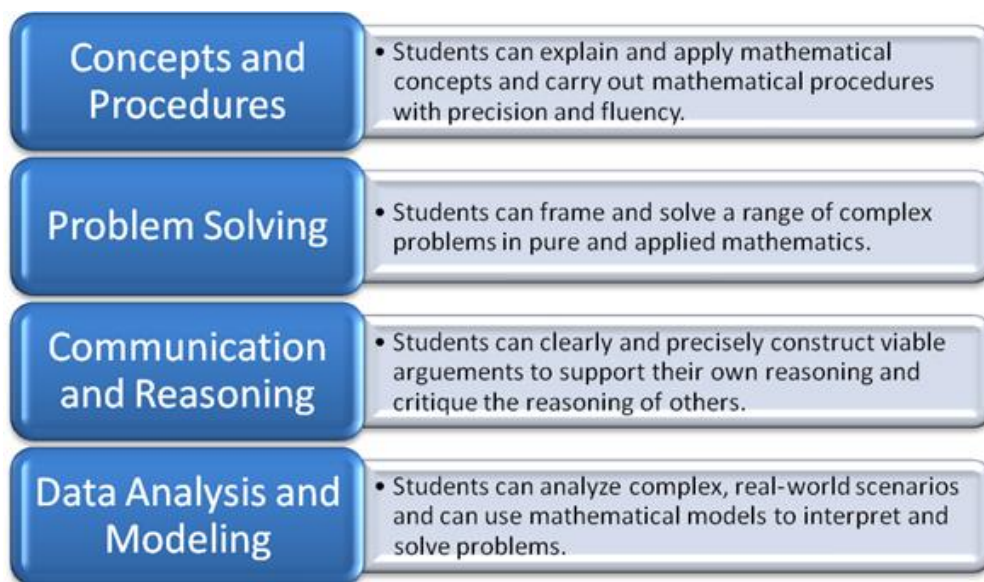
COURSE SYLLABUS

Pre-Calculus A/B

Last Modified: April 2015

Course Description: In this year-long Pre-Calculus course, students will cover topics over a two semester period (as designated by “A” and “B” sections). Students apply technology, modeling, and problem-solving skills to the study of trigonometric and circular functions, identities and inverses, and their applications, including the study of polar coordinates and complex numbers. Vectors in two and three dimensions are studied and applied. Problem simulations are explored in multiple representations—algebraic, graphic, and numeric. Quadratic relations are represented in polar, rectangular, and parametric forms. The concept of limit is applied to rational functions and to discrete functions such as infinite sequences and series. The formal definition of limit is applied to proofs of the continuity of functions and provides a bridge to calculus.

Learning Targets:



Semester A	Semester B
Chapter 1 <ul style="list-style-type: none"> • Modeling and Equation Solving • Functions and Their Properties • Twelve Basic Functions • Building Functions from Functions • Parametric Relations and Inverses • Graphical Transformations • Modeling with Functions Chapter 2	Chapter 6 <ul style="list-style-type: none"> • Vectors in the Plane • Dot Product of Vectors • Parametric Equations and Motion • Polar Coordinates • Graphs of Polar Equations • De Moivre's Theorem and nth Roots Chapter 7 <ul style="list-style-type: none"> • Solving Systems of Two Equations

<ul style="list-style-type: none"> • Linear and Quadratic Functions and Modeling • Power Functions with Modeling • Polynomial Functions of Higher Degree with Modeling • Real Zeros of Polynomial Functions • Complex Zeros and the Fundamental Theorem of Algebra • Graphs of Rational Functions • Solving Equations in One Variable • Solving Inequalities in One Variable <p>Chapter 3</p> <ul style="list-style-type: none"> • Exponential and Logistic Functions • Exponential and Logistic Modeling • Logarithmic Functions and Their Graphs • Properties of Logarithmic Functions • Equation Solving and Modeling • Mathematics of Finance <p>Chapter 4</p> <ul style="list-style-type: none"> • Angles and Their Measures • Trigonometric Functions of Acute Angles • Trigonometry Extended: The Circular Functions • Graphs of Sine and Cosine: Sinusoids • Graphs of Tangent, Cotangent, Secant, and Cosecant • Graphs of Composite Trigonometric Functions • Inverse Trigonometric Functions • Solving Problems with Trigonometry <p>Chapter 5</p> <ul style="list-style-type: none"> • Fundamental Identities • Proving Trigonometric Identities • Sum and Difference Identities • Multiple Angle Identities • The Law of Sines • The Law of Cosines 	<ul style="list-style-type: none"> • Matrix Algebra • Multivariate Linear Systems and Row Operations • Partial Fractions • Systems of Inequalities in Two Variables <p>Chapter 8</p> <ul style="list-style-type: none"> • Conic Sections and Parabolas • Circles and Ellipses • Hyperbolas • Quadratic Equations with xy Terms • Polar Equations of Conics • Three-Dimensional Cartesian Coordinate System <p>Chapter 9</p> <ul style="list-style-type: none"> • Basic Combinatorics • Binomial Theorem • Probability • Sequences • Series • Mathematical Induction <p>Chapter 10</p> <ul style="list-style-type: none"> • Probability • Statistics (Graphical) • Statistics (Numerical) • Random Variables and Probability Models • Statistical Literacy <p>Chapter 11</p> <ul style="list-style-type: none"> • Limits and Motion: The Tangent Problem • Limits and Motion: The Area Problem • More on Limits • Numerical Derivatives and Integrals
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Required Materials: Graphing Calculator
Note: This course contains an embedded softcopy textbook.

Content Standards: This course was written to Common Core State Standards as adopted by California within the Smarter Balance Consortium.

Pre-Requisites: A second-year Algebra course, for example Algebra II

Grade Scale:

Letter	Range (%)
A	95.0+
A-	90.0 – 94.9
B+	87.0 – 89.9
B	84.0 – 86.9
B-	80.0 – 83.9
C+	77.0 – 79.9
C	74.0 – 76.9
C-	70.0 – 73.9
D+	67.0 – 69.9
D	64.0 – 66.9
D-	60.0 – 63.9
F	0.00 – 59.9

Course Methodology: This is an inquiry-based course. Students will generate knowledge through online readings, asynchronous discussions with students and their instructor, interactions with online tutorials, and online and hands-on simulations. A semester project developed by each student will be used to demonstrate knowledge and understanding of the material in the course.

The instructor will act as a guide, a facilitator, an events planner, and a resource advisor. He/she will always be available through e-mail. The student must actively construct and acquire knowledge by being intrinsically motivated to succeed. To succeed, students must participate and complete all readings and activities. This course requires the student's active participation. Both formal and informal assessment methods will be used in the course. Informal assessment will include an evaluation of the quality and timeliness of participation in class activities. Formal assessment may include multiple-choice quizzes, tests, discussion board participation, and written assignments. A final exam will be given at the end of the course.

Course Expectations: Students are expected to conduct themselves in a responsible manner that reflects sound ethics, honor, and good citizenship. It is the student's responsibility to maintain academic honesty and integrity and to manifest their commitment to the goals of NUVHS through their conduct and behavior.



Students are expected to abide by all NUVHS policies and regulations. Any form of academic dishonesty, or inappropriate conduct by students or applicants may result in penalties ranging from warning to dismissal, as deemed appropriate by NUVHS.

Communication: Throughout this course students will need to be in close contact with their instructor and fellow students. Students are expected to communicate via email and electronic discussion boards. Therefore, students should plan on checking email at least three to five times a week and participate in the discussion boards during the weeks they are live.

Instructors strongly encourage and welcome open communication. Clear, consistent, and proactive communication will ensure a successful experience in this course. It is the student's responsibility to notify the instructor immediately if and when a personal situation occurs that affects his/her performance in this class. Being proactive with communication will result in a quick solution to any problems that may occur.

Support: At NUVHS you will have access to multiple support teams. Who you contact will depend on the questions you have. Always start by contacting your teacher through the Message Center in the course. Your teacher should be able to answer your question, but if they can't, then they will direct you to another support team. If you have questions about any of the course content, your grades, or course policies, you should contact your instructor.

For questions about your enrollment, transcripts, or general school-wide policies, you can contact NUVHS Student Services at info@nuvhs.org or by phone at 866.366.8847. For example, if you would like to withdraw from your course, you should contact Student Services. Please note that a refund for your course can only be obtained if you drop within the first seven days of enrolling in the course.

For help with login/password issues, or other technical issues specific to the Blackboard website, you can contact the team at [National University Blackboard Learn](#). They can also be reached by phone at (888) 892-9095.

Course Outline: Semester A

Unit	Topic	Activity
1	Algebra Review	<ul style="list-style-type: none"> • Diagnostic Exam • Lessons: A.1 to A.3 • Homework: A.1 to A.3 • Class Discussion • Algebra Review Quiz
2	Prerequisites	<ul style="list-style-type: none"> • Lessons: P.1 to P.7 • Homework: P.1 to P.7 • Class Discussion • Prerequisites Quiz
3	Functions and Graphs	<ul style="list-style-type: none"> • Lessons: 1.1 to 1.7 • Homework: 1.1 to 1.7 • Class Discussion • Chapter 1 Quiz 1 • Chapter 1 Quiz 2 • Chapter 1 Test
4	Polynomial, Power, and Rational Functions	<ul style="list-style-type: none"> • Lessons: 2.1 to 2.8 • Homework: 2.1 to 2.8 • Class Discussion • Chapter 2 Quiz 1 • Chapter 2 Quiz 2 • Chapter 2 Test
5	Exponential, Logistic, and Logarithmic Functions	<ul style="list-style-type: none"> • Lessons: 3.1 to 3.6 • Homework: 3.1 to 3.6 • Class Discussion • Chapter 3 Quiz • Chapter 3 Test • Midterm
6	Trigonometric Functions	<ul style="list-style-type: none"> • Lessons: 4.1 to 4.8 • Homework: 4.1 to 4.8 • Class Discussion • Chapter 4 Quiz 1 • Chapter 4 Quiz 2 • Chapter 4 Test

7	Analytic Trigonometry	<ul style="list-style-type: none"> • Lessons: 5.1 to 5.6 • Homework: 5.1 to 5.6 • Class Discussion • Chapter 5 Quiz • Chapter 5 Test
8	Project and Final	<ul style="list-style-type: none"> • Class Discussion • Class Project • Final Exam

Course Outline: Semester B

Unit	Topic	Activity
1	Applications of Trigonometry	<ul style="list-style-type: none"> • Diagnostic Exam • Lessons: 6.1 to 6.3 • Homework: 6.1 to 6.3 • Class Discussion • Chapter 6 Quiz
2	Applications of Trigonometry (Continued)	<ul style="list-style-type: none"> • Lessons: 6.4 to 6.6 • Homework: 6.4 to 6.6 • Class Discussion • Chapter 6 Test
3	Systems and Matrices	<ul style="list-style-type: none"> • Lessons: 7.1 to 7.4 • Homework: 7.1 to 7.4 • Class Discussion • Chapter 7 Quiz • Chapter 7 Test
4	Analytic Geometry in Two and Three Dimensions	<ul style="list-style-type: none"> • Lessons: 8.1 to 8.6 • Homework: 8.1 to 8.6 • Class Discussion • Chapter 8 Quiz • Chapter 8 Test • Midterm
5	Discrete Mathematics	<ul style="list-style-type: none"> • Lessons: 9.1 to 9.5 • Homework: 9.1 to 9.5 • Class Discussion • Chapter 9 Quiz • Chapter 9 Test

6	Statistics and Probability	<ul style="list-style-type: none">• Lessons: 10.1 to 10.5• Homework: 10.1 to 10.5• Class Discussion• Chapter 10 Quiz• Chapter 10 Test
7	Introduction to Calculus: Limits, Derivatives, and Integrals	<ul style="list-style-type: none">• Lessons: 11.1 to 11.4• Homework: 11.1 to 11.4• Class Discussion• Chapter 11 Quiz• Chapter 11 Test
8	Project and Final	<ul style="list-style-type: none">• Class Discussion• Course Project• Final Exam