## NATIONAL UNIVERSITY VIRTUAL HIGH SCHOOL

**COURSE SYLLABUS**

**Geometry A/B**                                                                                          **Last Modified:  2012**

Course Description:    In this year-long Geometry course, students will cover topics over a two semester period (as designated by "A" and "B" sections). Students learn the language of geometry, area and perimeter, inductive and deductive reasoning, geometric construction, geometric proof, angle properties, properties of parallel and perpendicular lines, coordinate geometry, triangle congruence, properties of triangles, and properties of quadrilaterals. Students calculate perimeter, area, surface area, and volume; solving right triangles; similar triangles; transformations; circle theorems; and, the effect that change has on perimeter, area, and volume measurements.

Learning Targets:

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|---|---|
| **Concepts and Procedures** | • Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency. |
| **Problem Solving** | • Students can frame and solve a range of complex problems in pure and applied mathematics. |
| **Communication and Reasoning** | • Students can clearly and precisely construct viable arguments to support their own reasoning and critique the reasoning of others. |
| **Data Analysis and Modeling** | • Students can analyze complex, real-world scenarios and can use mathematical models to interpret and solve problems. |

| Semester A | Semester B |
|---|---|
| <ul><li>Nets and drawings for visualizing geometry</li><li>Points, lines, and planes</li><li>Measuring segments</li><li>Measuring angles</li><li>Exploring angle pairs</li><li>Basic Constructions</li><li>Midpoint and distance in the coordinate plane</li><li>Perimeter, circumference and area</li><li>Patterns and inductive reasoning</li><li>Conditional statements</li><li>Biconditionals and definitions</li><li>Deductive reasoning</li><li>Reasoning in algebra and geometry</li></ul> | <ul><li>Ratios and Proportions</li><li>Similar Polygons</li><li>Proving Triangles Similar</li><li>Similarity in Right Triangles</li><li>Proportions in Triangles</li><li>The Pythagorean Theorem and Its Converse</li><li>Special Right Triangles</li><li>Trigonometry</li><li>Angles of Elevation and Depression</li><li>Vectors</li><li>Translations</li><li>Reflections</li><li>Rotations</li><li>Symmetry</li></ul> |

- Proving angles congruent
- Lines and angles
- Properties of parallel lines
- Proving lines parallel
- Parallel and perpendicular lines
- Parallel lines and triangles
- Constructing parallel and perpendicular lines
- Equations of lines in the coordinate plane
- Slopes of parallel and perpendicular lines
- Congruent figures
- Triangle congruence by SSS and SAS
- Triangle congruence by ASA and AAS
- Using corresponding parts of congruent triangles
- Isosceles and Equilateral triangles
- Congruence in right triangles
- Congruence in overlapping  triangles
- Midsegments of triangles
- Perpendicular and angle bisectors
- Bisectors in triangles
- Medians and altitudes
- Indirect proof
- Inequalities in one triangle
- Inequalities in two triangles
- The polygon angle-sum theorems
- Properties of parallelograms
- Proving that a quadrilateral is a parallelogram
- Properties of rhombuses, rectangles, and squares
- Conditions for rhombuses, rectangles and squares
- Trapezoids and kites
- Polygons in the coordinate plane
- Applying coordinate geometry
- Proofs using coordinate geometry

- Dilations
- Compositions of Reflections
- Tessellations
- Area of Parallelograms and Triangles
- Areas of Trapezoids, Rhombuses and Kites
- Areas of Regular Polygons
- Perimeters and Areas of Similar Figures
- Trigonometry and Area
- Circles and Arcs
- Areas of Circles and Sectors
- Geometric Probability
- Space Figures and Cross Sections
- Surface Areas of Prisms and Cylinders
- Surface Areas of Pyramids and Cones
- Volumes of Prisms and Cylinders
- Volumes of Pyramids and Cones
- Surface Areas and Volumes of Spheres
- Areas and Volumes of Similar Solids
- Tangent Lines
- Chords and Arcs
- Inscribed Angles
- Angle Measures and Segment Lengths
- Circles in Coordinate Plane
- Locus: A Set of Points

Required Materials:    Scientific or 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:    Algebra I

Grade Scale:

| Letter | Range (%) |
| --- | --- |

| | |
|---|---|
| A | 97-100 |
| A | 94-96 |
| A- | 90-93 |
| B+ | 87-89 |
| B | 84-86 |
| B- | 80-83 |
| C+ | 77-79 |
| C | 74-76 |
| C- | 70-73 |
| D+ | 67-69 |
| D | 65-66 |
| D- | 60-64 |
| F | 0-59 |

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.

Technical Support is offered through Spectrum Pacific Learning Company (SPLC).  Should a student need any technical assistance, he/she should email the Help Desk as soon as possible at helpdesk@myonlinelogin.com  or call 1-877-252-7715.  SPLC will help resolve technical problems and walk through the solution with students.  If a problem persists for more than 48 hours, the student must also notify his/her teacher(s) and NUVHS.

**Course Outline**

**Semester A**

| Unit | Topic | Activity |
|------|-------|----------|
| 1 | Tools of Geometry Part 1 | <ul><li>Diagnostic Exam</li><li>Reading Assignment Chapter: 1.1 to 1.3</li><li>Homework Assignment: 1.1 to 1.3</li><li>Class Discussion</li><li>Unit 1 Quiz</li></ul> |

| 2 | Tools of Geometry Part 2 | <ul><li>Reading Assignment Chapter: 1.4 to 1.8</li><li>Homework Assignment: 1.4 to 1.8</li><li>Class Discussion</li><li>Unit 2 Quiz</li></ul> |
|---|---|---|
| 3 | Reasoning and Proof | <ul><li>Reading Assignment: 2.1 to 2.6</li><li>Homework Assignment: 2.1 to 2.6</li><li>Class Discussion</li><li>Unit 3 Quiz</li></ul> |
| 4 | Parallel and Perpendicular Lines | <ul><li>Reading Assignment: 3.1 to 3.8</li><li>Homework Assignment: 3.1 to 3.8</li><li>Class Discussion</li><li>Unit 4 Quiz</li><li>Midterm</li></ul> |
| 5 | Congruent Triangles | <ul><li>Reading Assignment: 4.1 to 4.7</li><li>Homework Assignment: 4.1 to 4.7</li><li>Class Discussion</li><li>Unit 5 Quiz</li></ul> |
| 6 | Relationships within Triangles | <ul><li>Reading Assignment: 5.1 to 5.7</li><li>Homework Assignment: 5.1 to 5.7</li><li>Class Discussion</li><li>Unit 6 Quiz</li></ul> |
| 7 | Polygons and Quadrilaterals | <ul><li>Reading Assignment: 6.1 to 6.9</li><li>Homework Assignment: 6.1 to 6.9</li><li>Class Discussion</li><li>Unit 7 Quiz</li></ul> |
| 8 | Project and Final | <ul><li>Class Discussion</li><li>Class Project</li><li>Final Exam</li></ul> |

**Semester B**

| Unit | Topic | Activity |
|---|---|---|
| 1 | Similarity Part 1 | <ul><li>Diagnostic Exam</li><li>Reading Assignment: 7.1 to 7.3</li><li>Homework Assignment: 7.1 to 7.3</li><li>Class Discussion</li><li>Unit 1 Quiz</li></ul> |
| 2 | Similarity Part 2 | <ul><li>Reading Assignment: 7.4 to 7.5</li><li>Homework Assignment: 7.4 to 7.5</li><li>Class Discussion</li><li>Unit 2 Quiz</li></ul> |

| 3 | Right Triangles and Trigonometry | • Reading Assignment: 8.1 to 8.5<br>• Homework Assignment: 8.1 to 8.5<br>• Class Discussion<br>• Unit 3 Quiz |
|---|---|---|
| 4 | Transformations | • Reading Assignment: 9.1 to 9.7<br>• Homework Assignment: 9.1 to 9.7<br>• Class Discussion<br>• Unit 4 Quiz<br>• Midterm |
| 5 | Area | • Reading Assignment: 10.1 to 10.8<br>• Homework Assignment: 10.1 to 10.8<br>• Class Discussion<br>• Unit 5 Quiz |
| 6 | Surface Area and Volume | • Reading Assignment: 11.1 to 11.7<br>• Homework Assignment: 11.1 to 11.7<br>• Class Discussion<br>• Unit 6 Quiz |
| 7 | Circles | • Reading Assignment: 12.1 to 12.6<br>• Homework Assignment: 12.1 to 12.6<br>• Class Discussion<br>• Unit 7 Quiz |
| 8 | Project and Final | • Class Discussion<br>• Course Project<br>• Final Exam |