**Algebra and Trigonometry**
A first course

**Meeting days and times:**
Days of Class: Monday and Thursday
Time: 1:20PM – 2:50 PM
Location: The Praxeum, Portsmouth NH
Start Date: Thursday September 1st, 2016
No Class Labor Day, September 5th, 2016
Schedule may change in 2017
**Professor Information**

Darren Tapp
Email address: tappdarren@gmail.com
Web address: http://www.darrentapp.com
Office: The Praxeum
Office Hours: 3PM-5:15 Monday and by appointment
Phone: (603) 486-3029

**NOTE:** This course is developed two months at a time. This course devotes six months to Algebra and eight months to trigonometry. Two months is spent on each topic at a time. By switching back and forth between the subjects it is hoped that retention can be evaluated and enhanced.

**Course Description:** September and October we will begin with a review of arithmetic including multiplication, long division, and fractions, as well as the commutative, associative, and distributive properties. We will then cover algebraic concepts such as variables, properties of exponents, the binomial theorem, polynomials, long division of polynomials, and rational expressions. November and December we will begin with an introduction to

trigonometry. We expect to cover Chapters 0, 1, 4 and 5 of our text. This will include topics such as the Pythagorean theorem, trigonometric ratios, solving right triangles, angles and their measure including the unit of radians.

**Prerequisite:** The student should be proficient in arithmetic.

**Assessments:** Three assessmentsare planned. One is a basic level Algebra and Trigonometry exam. The other is an advanced Algebra and Trigonometry exam. The third will deal with topics in linear algebra.

**Texts:** *Algebra* by I.M. Gelfand and A. Shen. **ISBN:** 978-0-8176-3677-7
*Trigonometry* by I.M. Gelfand and Mark Saul. **ISBN:** 978-0-8176-3914-3

## Course Policies:

- **General**
  - Students are expected to contribute to class. This may include spoken or written engagement.
  - Questions are always welcome. If there is not time to address a question in class, then it's appropriate to address that question out of class.
  - Some time reviewing material independently out of class is expected.
  - A good faith effort is expected for completion of all assignments.
- **Assignments**
  - Every Thursday students will be asked to think about and read the material.
  - Every Thursday homework will be assigned. Students are expected to attempt all assigned problems.
  - The following Monday the assignment will be collected. Students are expected to alert the professor as to any questions that were unanswered. The professor will then go over those problems the same day if possible.
- **Attendance and Absences**
  - For best results attendance of most classes is needed.
  - Informing the professor of an absence by phone or email is helpful for planing the course.
  - An absent student should email any uncompleted problems to the professor and request to review those problems.
  - When there are extenuating circumstances, attendance may be possible remotely.

**Academic Honesty Policy Summary:** Students should accurately represent their work at all times. This will help the professor with instruction.

**Tentative Course Outline**:
The weekly coverage might change as it depends on the progress of the class.

| Week | Content | Read Through |
|---|---|---|
| Week 1 | • Fractions<br>• Long division | Section 5 |
| Week 2 | • The binary system<br>• Commutative and associative properties | Section 9 |
| Week 3 | • Exponents<br>• Order of operations<br>• Variables<br>• Distributive property<br>• Fractions review | Section 16 |
| Week 4 | • Negative powers<br>• Properties of exponents<br>• Scientific notation | Section 21 |
| Week 5 | • Multiplying binomials | Section 24 |
| Week 6 | • Binomial theorem<br>• Pascal's triangle/binomial coefficients | Section 27 |
| Week 7 | • Polynomials | Section 31 |
| Week 8 | • Rational Expressions | Section 35 |
| Week 9 | • Polynomial division/Euclidean algorithm | Section 37 |

| | | |
|---|---|---|
| Week of October 31st | • Angles<br>• Right Triangles<br>• Square Roots<br>• Pythagorean Theorem | *Trigonometry* Section 0.3 |
| Week 11 | • 45-45-90 Triangles<br>• 30-60-90 Triangles<br>• Proof of Pythagorean Theorem | Section 0.6 |
| Week 12 | • $\sin(\alpha)$, The Sine of an Angle.<br>• Trigonometric Ratios<br>• Relationship of Sine and Cosine. | Section 1.4 |
| Week 13 | • Explaining and Expanding on Sine and Cosine<br>• Sine and Cosine of limiting values<br>• No Class November 26th | Section 1.8 |
| Week 14 | • Introduction to Trigonometric Identities | Section 1.11 |
| Week 15 | • Angles of Rotation<br>• Unit Circle<br>• Radians | Chapter 4 through 5.1 |
| Week 16 | • Odd and Even Functions<br>• Radian Measure | Chapter 4 through 5.4 |
| Week 17 | • Graphing Trigonometric Functions<br>• No Class December 24 | Chapters 0,1,4,5 |
| Week 18 | • Review<br>• New Algebra Syllabus Distributed | Chapters 0,1,4, and 5 |
| Week 19 | Christmas Break | Algebra Review |