**Course: M1527** – Introduction to Differential Calculus **Instructor** – Andrew Spieker

**Tentative Location/Time** – Room 2-136, Sunday 2:00 AM – 4:00 PM

Hello, and welcome to M1527!

My name is Andrew Spieker. I am an undergraduate at Northeastern University majoring in mathematics, specializing in algebraic structures and possibly topology. **(If you haven’t yet, you can get a preview of algebraic structures and group theory by registering for my other class, M1525 – Overlooked Mathematics; the prerequisites are similar)**

Calculus is something that people refer to as a huge turning point in mathematics. Well, this is true. It is one of the most elegant subjects because it involves things that we cannot exactly touch or put out finger on. In some ways, it is the ‘perfect’ math, because it gives us some surprising results and allows us to do things we didn’t think we could do. In this seminar, we will ask key questions involving instantaneous rate of change, and attempt to answer these questions by formulating hypotheses and making intuitive sense out of

Calculus can be a relatively esoteric subject to those who don’t have a relatively strong background in algebra. We won’t be doing so much algebraic manipulation in this seminar (maybe a little bit,) but most of the “letters” will come from concepts. The concepts are based on a very elegant logic, though, that requires a willing mind. These are meant to be ‘words of comfort’ in that you’re not expected to understand everything we cover. In fact, some of the concepts may annoy you for quite some time, and take a while to sink in. That’s one of the most satisfying parts of mathematics, though. Would you agree?

Also note that even if you have taken a calculus course previously, this particular class does not present the material in the same way of a typical college course. I take a rather analytical and conceptual approach, as opposed to trying to nail formulae and discuss the contexts in which calculus is used. That, you will do in college.

Thank you for registering for M1527; I’m sure we’ll make this an enjoyable and satisfying journey.

Regards,

Andrew Spieker

**BRING WITH YOU:** A pen or pencil for activities and evaluations, and a willing mind to learn!

**Tentative Schedule:**

Introduction/Preliminary Survey (5 minutes)

Warm-Up with n-gons (5 minutes)

Limits and Limit Notation (10 minutes)

Point Continuity (10 minutes)

Slope (5 minutes)

Secant Lines (5 minutes)

From Secant to Tangent (10 minutes)

Evaluating Difference Quotient (15 minutes)

Power Rule (5 minutes)

Exercises, Inferences, Questions (20 minutes)

Higher Order Derivatives (10 minutes)

Curve Sketching (10 minutes)

Closing Remarks, Evaluations (10 minutes)