(1.5-0-0; 1.5-0-0) **Topics in Mathematics (Theory of Everything)** MATH-491*

This course will discuss applications of Number Theory and Algebraic and Arithmetic Geometry. Special emphasis will be placed on algorithmic and explicit methods. It is intended to be a friendly introduction to what is happening in the research fronts today.

The course will discuss many brilliant ideas in mathematics: how they came about (and how to come up with such ideas), why they are good for, and sample results stemming from these ideas in mathematics and mathematical physics.

We discuss many topics, which include, Introduction to Algebraic Geometry, p-adic numbers and global-local principle, Riemann surfaces, semi-simple Lie algebras and applications.

Textbook: *Instructor's Notes*

Prerequisite: Permission of the instructor.

Instructor: N. Yui

Evaluation:

Oral Presentations	50%
Written Projects	50%

Projects (2005):

- Rational points on conics and p-adic numbers
- Introduction to Algebraic Geometry
- Algebraic Geometry
- Classification of semisimple Lie Algebras