

MATH 605 (Fall 2020- Online)  
Instructor:  
E-mail:

Learning Theories in Mathematics  
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*Omnium rerum principia parva sunt - Cicero*

This course will survey learning theories in mathematics starting from behaviorism onto constructivist and complexity theories that inform learning. We will also focus on theory development shifts toward model development- i.e., modeling perspectives as alternatives to traditional theories. In other words, models of mathematical cognition that are applicable to the learning of arithmetic, algebra, geometry, statistics and Calculus.

Texts (provided as a pdf files)

- Sriraman, B., and English, L. (2010). *Theories of Mathematics Education*. Springer Berlin
- Selection of readings from the research literature.

Course Objectives

- To familiarize students' with mathematics education learning theories.
- Students begin to engage with the literature to prepare for action research

**Note:** This is a 600 level reading intensive graduate course and I expect you to take the initiative to complete all the readings in a timely manner. You will have the following assignments to complete over the course of the semester

ASSIGNMENTS – All assignments should be sent via email where applicable

SUMMARIES OF WEEKLY READINGS 40 points [2 x 20]

You will complete 2 summaries (reviews) of the weekly readings. The summary should be approximately 1500 words and provide a gist of the reading, the learning theory framework used (if any) and implications for teaching/learning mathematics. You are free to choose which readings you would like to summarize.

Summary 1 is due Sept. 28; Summary 2 is due October 28.

DISCUSSION THREAD ON MOODLE 40 points [10 for leading, and 30 for reactions]

Each student will initiate ONE discussion thread (as a Discussion Leader) based on one weekly reading, with questions related to the reading. All other students are expected to react to the questions posed. A schedule will be provided for this starting August 31<sup>st</sup>.

RESEARCH 40 points

This assignment will introduce in a microscopic way the realities of writing a qualitative math-ed project or Master's thesis. You will "hypothetically" design a small study in this course. The prudent thing to do is to align this closely to the readings. This experiment can be either a replication of a study you have reviewed/read; an extension of a study; or something brand new if you wish. You will write a 2000 word "mock" research paper that provides details of your study – which includes the research question (or questions), the learning theory framework and implications of this study for your practice. Due date: November 19<sup>th</sup>.

GRADES: 108-120: A; 96-107:B; 84-106:C; 72-83: D; < 72: F