

## *Sample only*

### Course Descriptions for Math M.Ed. Summer Year 1

#### Rational numbers: How students learn mathematics

We will begin this Masters in Math Education journey together by focusing on the most important aspect of teaching—student learning. Student learning will be central to our work throughout the program. In particular this quarter we will enhance our capacity to formatively assess students' mathematical knowledge. Four key approaches will be to (a) access and understand research on students' conceptions, (b) interview students, (c) listen carefully to classroom conversations, and (d) examine student work. These four tools are both practical tools for learning about students' mathematical ideas as well as effective, when used skillfully.

Throughout this program we will also deepen our knowledge of the mathematics we may teach (while also taking elective courses to learn mathematics that lie beyond what you will teach). The mathematical explorations as a cohort will provide a knowledge depth for us to learn what to uncover about student thinking as well as how to focus instruction on central mathematical ideas. During the first quarter our examination will be on rational number. What are the big mathematical ideas of rational number? Why do people often struggle with fractions, decimals and percents? What does research on rational number reveal about important instructional practices to support student learning? Learning mathematics should be exciting, invigorating, and challenging.

This quarter we will also begin to lay a foundation for considering affective aspects of learning mathematics. The concept of "math phobia" was popularized long ago. While we will not explore the psychological concept of phobias, we will consider what aspects of the mathematical environment can be established and developed to support students' self-efficacy and mathematical achievement.