# Program Cover Document – STA 216/Statistical Inference and Probability

## I. Basic Course Information

This course introduces future mathematics educators to statistical ideas and concepts with an emphasis on methods of statistical inference (notably confidence intervals and hypothesis tests) and probability (notably conditional probability, the binomial distribution, and concepts relating to independence and disjoint probabilities). Prerequisite or corequisite: MAT 125 or MAT 127.

## II. Learning goals

This course addresses three main learning goals for the Mathematics Education programs. Future teachers need to 1) "master the content knowledge needed to teach in the secondary schools," and furthermore, have 2) "background in higher level mathematics that allow them to teach competently and confidently." In particular, this course introduces future mathematics educators to statistical ideas and concepts with an emphasis on methods of statistical inference (notably confidence intervals and hypothesis tests) and probability (notably conditional probability, the binomial distribution, and concepts relating to independence and disjoint events). The course covers all of the PRAXIS II exam (licensure exam) topics in Statistics and Probability, as well as the topics in the Core Curriculum Content Standards (CCSS) relating to Statistics and Probability. Furthermore, future teachers need to 3) "effectively utilize technology and determine how to meaningfully integrate technology in teaching mathematics." In this course, all topics and learning outcomes will be integrated with technology most commonly found in the high school classroom. Future teachers will learn how to use technology while learning statistics and probability and later, in their methods courses, will learn how to teach these topics using technology.

## III. Student assessment

A combination of homework problems and exams throughout the course will be given to provide valuable information both for the instructor and the individual students as to how well they are doing. Student performance on these assessment instruments and the performance of students in their future professional courses, such as MTT 380, MTT 390 and MTT 490 (Student teaching), will be used to assess the success of STA 216 in achieving its learning goals and its contribution to the fulfillment of the Mathematics Education program goals.

## IV. Learning activities

Students must experience standards-based teaching and learning in order to understand how to implement it. At the discretion of the instructor, learning activities will include any or all of the following: attendance at lectures, in-class activities, reading assignments, graded homework assignments, and using graphing calculators and Excel spreadsheets to solve probability problems, calculate inference test outcomes and confidence intervals, and compute basic descriptive statistical summary information. By completing these learning activities, and in particular, using the technology to learn these concepts, students will be better prepared for learning how to teach statistics and probability in their methods courses, MTT 380 and 390.

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