

Course Tag Reflection Exemplar
Scientific Inquiry & Research Skills

Joanna Masingila, Ph.D.

MAT 117: Foundational Mathematics via Problem Solving I

Identify the course learning objectives in the syllabus that are clearly aligned to Scientific Inquiry & Research Skills and respective assignment(s).

Three CLOs clearly align to Scientific Inquiry and Research Skills.

1. Have a deep understanding of numeration, operations, number theory, probability and statistics concepts and processes that are foundational for PreK-6 school mathematics.
2. Engage in mathematical thinking, reasoning, communication, and problem solving.
3. Use technology as a tool to explore, learn, and communicate mathematics.

The first CLO concerns students gaining a deep understanding of mathematical ideas that are foundational for ideas they will be teaching as PreK-6 teachers. In order to gain this deep understanding, students are engaged in problem solving and rethinking their understanding of mathematics relationships and concepts. The second and third CLO concerns the activities that students are engaged in throughout this course - mathematical thinking, reasoning, communication, problem solving, and using technology as an inquiry tool. Each of these activities is part of the inquiry and problem-solving process that will result in new and deeper understandings for the students and thus generates new knowledge.

Explain the connection between specific assignment(s) and Scientific Inquiry & Research Skills. At least 30% of the course grade must engage students in the selected competency for the course to be tagged.

Midterm Exams (2 exams, each consisting of a group part and an individual part) - worth 30%: comprised of mathematical problems that students solve related to the content learned prior to each exam; since students are engaged each day in class in collaborative problem solving, there is a group part to each exam where the group solves a novel problem followed by individual follow-up questions to assess if group members are able to apply their group solution to a similar problem. There is also a strictly individual part to each midterm exam.

Final Exam - worth 20%: comprised of mathematical problems that students solve related to the content learned in the course

At least 50% of the final grade relates to this competency.

Describe in detail the instructional strategies faculty use to intentionally teach Scientific Inquiry & Research Skills in the course.

In this course, students are engaged in small group problem solving each class meeting. The instructor introduces the activities and monitors the students' collaborative work. The problems are non-routine and require problem-solving strategies to solve them. The instructor facilitates whole-class and small-group discussions to support students' justifications and argumentation as they generate new knowledge individually and collectively.

Describe the feedback tool(s) faculty use to support students' competency development on Scientific Inquiry & Research Skills.

Instructors provide feedback to students through (a) oral feedback in class during small-group and whole-class discussions, (b) written comments on graded problem solutions in the folders, (c) oral formative feedback to groups as they work on their projects and written summative feedback on their projects, (d) written comments on quizzes, (e) written comments on their mathematics autobiography, (f) written comments on midterm exams (both group and individual), (g) during office hours, and (h) oral and written feedback on their class participation.