

## Course Tag Reflection Exemplar Critical and Creative Thinking

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**MAT 117: Foundational Mathematics via Problem Solving I**

**Identify the course learning objectives in the syllabus that are clearly aligned to Critical & Creative Thinking and respective assignment(s).**

Three CLOs clearly align to Critical & Creative Thinking.

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. Reflect on their learning of 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 critical exploration of these mathematical ideas through problem solving.

The second and third CLO concerns the processes that students are engaged in throughout this course - mathematical thinking, reasoning, communication, problem solving, and reflection. Each of these processes is creative in that students will engage in them uniquely and in ways that make sense to them.

**Explain the connection between specific assignment(s) and Critical & Creative Thinking. At least 30% of the course grade must engage students in the selected competency for the course to be tagged.**

Folders (collected 4 times throughout the semester) - worth 20%: comprised of students' individual and group problem solving work in which students solve problems and justify their solutions, develop mathematical insights and make and test conjectures.

Projects (2 - one smaller, one larger) - worth 20%: smaller project is comprised of students making sense of data, developing insights and producing a product to represent their interpretations (smaller project); larger project is comprised of students exploring some contexts involving mathematical relationships, developing insights, and producing a product to represent their understandings of the mathematical relationships.

Quizzes, Papers, Class Participation - worth 10%: comprised of typically bi-weekly quizzes where students explain a mathematical idea or evaluate a mathematical argument, a mathematics autobiography paper, and class participation in small group problem solving. At least 50% of the final grade relates to this competency.

**Describe in detail the instructional strategies faculty use to intentionally teach Critical & Creative Thinking 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. Students are encouraged to be creative in their problem solutions and the instructor looks for different ways that students have solved a problem and asks them to share with the class. The problems are non-routine and require critical problem-solving strategies to solve them. The instructor facilitates whole-class and small-group discussions to encourage critical and creative thinking.

**Describe the feedback tool(s) faculty use to support students' competency development on Critical & Creative Thinking.**

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.