MATH 130 – Thinking Mathematically

Course Description from Bulletin: This course allows students to discover, explore and apply modern mathematical ideas. Emphasis is placed on using sound reasoning skills, visualization of mathematical concepts and on communicating mathematical ideas effectively. Classroom discussion and group work on challenging problems are central to the course. Topics from probability, statistics, logic, number theory, graph theory, combinatorics, chaos theory, the concept of infinity, and geometry may be included. (3-0-3) (C)

Enrollment: This course serves as partial fulfillment of IIT's general education requirement in mathematics.

Textbook(s): Burger and Starbird, *The Heart of Mathematics: An invitation to effective thinking*, 3rd ed., Wiley & Sons, 2010

Other required material: None

Prerequisites: None

Objectives:

1. Students will attain a better understanding of some rich mathematical ideas.
2. Students will apply mathematical reasoning to analyze real-life problems and societal issues. They will learn to communicate these ideas verbally through classroom discussions.
3. Students will develop their ability to comprehend mathematical ideas in written form by being prepared to discuss assigned readings from the text or other sources.
4. Students will develop their problem solving ability and their ability to clearly explain mathematical ideas by writing "polished" solutions to homework problems.
5. Students will work in small groups on projects. They will communicate their findings by means of a written report, a poster, and/or classroom presentations.
6. Student will develop critical thinking skills by giving constructive criticism and comments in regards their classmates group work and presentations.
7. Students will reflect on the skills they have developed during the semester that transcend mathematics.

Lecture schedule: Two 75 minute lectures per week

Course Outline:	Hours
1. Problem Solving	4
2. Fractals and Chaos	8
3. Probability	8
4. Statistics	8
5. Deciding Wisely: Applications of Rigorous Thinking	8

Assessment:	Homework	10-20%
	Class Participation	5-10%
	Projects	20-30%
	Tests/Quizzes	30-40%
	Final Exam	15-25%

Syllabus Prepared by: Fred Weening and Greg Fasshauer
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