MATH 230
– INTRODUCTION TO DISCRETE MATHEMATICS –
SPRING 2017

Meeting: TR 11:25-12:40
Classroom: 240 Robert A. Pritzker Science Center
Instructor: Dr. Benjamin ("Ben") Reiniger
Office: 110 Rettaliata Engineering Building
Email: breiniger@iit.edu (please include "Math230" in your subject lines)
Website: `http://www.math.iit.edu/~breiniger/teaching/teachingS17`
Office Hours: M 11:25-12:40, W 1:50-3:05
I can often accommodate additional office hours by appointment.

Text: *Discrete Mathematics*, by Sandi Irani, a zyBooks e-book. Registration instructions (including the access code for our course) are available in Blackboard.

Course Content: This course has two main focuses: mathematical rigor (proofs) and an introduction to discrete structures.

For everyone, the introduction to proof in this course solidifies careful critical thinking. Especially for math majors, the introduction to proof in this course is a gateway and often prerequisite to many upper level mathematics courses, including analysis, number theory, abstract algebra, geometry, optimization, and combinatorics.

Discrete mathematics deals with collections of objects that are distinct and separable (as opposed to continuous mathematics and its smoothly varying objects). For example, we deal with finite sets or the integers rather than all the real numbers.

Approximate topics and timeline:

Topic	# classes
Logic	4
Proofs	3
Sets, Functions	3
Algorithms	2
Number Theory	4
Induction/Recursion	3
Counting	2
Relations	2
Graphs/Trees	3

Course structure: The course will be run using the *active learning* method, with some components from the *flipped classroom* model. You will be given assigned readings and activities from the zyBook to complete before class; in class, I will sometimes give brief lectures to point out important aspects of your reading, and the rest of the time will be spent working together in groups on problems; after class, written homework and perhaps Challenge problems from the zyBook will be assigned.

This kind of approach, and the zyBook publisher in particular, have solid research demonstrating their benefit. The zyBook in particular is designed to be brief; the assigned readings have been extremely streamlined, and respect your time.

Grading: Your course grade will be obtained roughly as follows:

- Readings: 7.5%
- Homework: 10%
- Participation/worksheets: 7.5%
- Quizzes: 5%
- Exam 1: 20%
- Exam 2: 20%
- Final Exam: 30%

The assignment of letter grades will be no more strict than the standard 10 point scale.

No late work will be accepted. Instead, the lowest 3 readings, 2 homework, 3 participations, and 1 quiz will be dropped. (You are still responsible for the understanding the content!) If you need to miss an exam, advance notice is vastly superior; if official documentation is provided, a conflict exam will be provided.

Grading of written work is based on the following criteria:

- Content: correctness of the mathematical ideas.
- Style: the explanations of your work, where applicable. This course counts towards your "communications" requirement, so clarity of writing is important.

Written assignments will be returned graded and commented. If you have any questions or concerns about the grade or comments, contact me within a week for clarification/regrade.

Homework: You are encouraged to work on homework in whatever groups you like. (I suggest meeting in groups of 3 or 4.) However, it is your responsibility to ensure that you understand the concepts and methods presented or reinforced by the homework. To this end,

you must write your homework solutions on your own.

Discuss with others freely before writing, but write solutions alone (without notes from your collaboration).

Homework should be neat: legible handwriting, clearly organized and separated solutions, no notebook paper fringe, etc.

Quizzes & Exams: We will have two exams during the semester as well as a final exam. Quizzes and exams will be taken without the aid of calculators and other electronic devices, notes, or classmates.

Places to go:

- Applied Mathematics TAs offer free office hours in RE129. Schedule TBA.
- Academic Resource Office tutors, arc.iit.edu.
- Me! Aside from office hours, I am often in my office and available to answer questions.

If you are asking about a problem from the homework, you must alert the tutor or TA of that fact.

Attendance Policy: You are expected to attend every class meeting. Especially for the "active learning" component, your absence negatively affects others in the class. If you miss a meeting, you are responsible for catching up on the material.

For University excused absences, contact me to determine appropriate accommodations. Remember that you are responsible for all information that you miss.

Decorum: During our meetings you should be respectful of everyone's time. Please silence cell phones. Do not use electronic devices except to access course materials. I don't mind if you bring food, but do so in a way that is not distracting to others. Late arrivals and early departures are also disruptive.

Academic Integrity: Academic Integrity may be summed up by the phrase, "your work must be your own." Please take note of the collaboration policy in the *Homework* section above; violating the terms there constitutes a breach of academic integrity, and will be pursued as any other violation.

Quoting from the CAC's plagiarism statement, plagiarism includes:

- Paraphrasing or summarizing someone's words without citing the source
- Stating ideas or research specifically attributed to another person without citing the source

Violations will be processed according to the established guidelines. Please note that it is a violation "to engage...in a course of action that would cause a reasonable student to conclude a violation...would be the likely result." A range of academic sanctions may be taken against a student who engages in academic dishonesty. Please see Article I of the Handbook for additional information and procedures.

Disabilities: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. Please also make an appointment with me to discuss implementation of accommodations. If you will be taking an exam outside of normal class hours, I need at least 5 business days' notice to accommodate you.

Other resources:

- Communication Across the Curriculum, web.iit.edu/cac
- Writing Center, Siegel Hall rooms 232 and 233
- Student Health and Wellness Center, web.iit.edu/shwc

Feedback: You will have several opportunities during the semester to provide feedback on this class. Please make use of these opportunities, and have thoughtful comments ready. You don't need to wait for these opportunities: if you have suggestions/questions/comments, please let me know.

I look forward to working with all of you this semester. Good luck!