

DISCRETE MATHEMATICS

Course Syllabus for T2: 2017-2018

Instructor: Piti Ongmongkolkul(piti.ong@mahidol.ac.th)

Time: Monday/Wednesday 14:00 – 15:50.

Grading Scheme

Assignment	20 %
Midterm	40 %
Final	40 %

Homework

This is a kind of math that most, if not all, of you have not seen before. Depending on your background, this might be a culture shock for you. Here are my suggestions: it is extremely important that

1. You **must** read all the questions right when the homework is posted.
2. You **must** start working on it at least 72 hours or more before it is due. The answer for each one is relatively short but you will need a lot of time to think about it. Ask your upperclassmen.

Homework Collaboration Policy

Remember that all I want from you is for you to learn how to reason. There is no way to do that except practicing. Each of the homework problem are hand crafted carefully for you to learn a particular point. The homework is for you to learn.

The collaboration for the homework is a bit tricky. This is because the skill to understand the solution and the skill to come up with the solution are very different set of skills. We want you to have the joy of enlightenment after long struggle with the problems. This is the same joy as the one you have when you beat a very difficult game and thus enjoy the ending. You would regret if someone spoil you the ending before you even start the game. So, even though collaboration is encouraged. You should only give hints(eg. weak spot of bosses) to your friends. DO NOT tell your friends the solution directly. Not only is it not allowed, you are hurting your friends by doing so. Those who do homework with spoiler will find the exam extremely difficult.

Textbook and online resources

Mathematics for Computer Science by Lehman, Leighton, Meyer. The same book MIT, Harvard, and Princeton use for their math for CS course. You can find it on canvas or on their website. https://www.seas.harvard.edu/courses/cs20/MIT6_042Notes.pdf

Accompanying the book, there is an online lecture by Leighton himself. You can find it at <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2010/index.htm>. I stole a bunch of trick from him.

Other books I recommend are Book of Proof by Hammack. You can find it free online (<http://www.people.vcu.edu/~rhammack/BookOfProof/>). Discrete Mathematics and Applications by Susanna Epp; you can find it in the library.

If you really enjoy the kind of problems you see in the class, I suggest Problem-Solving Strategies by Arthur Engel. The problems in this book requires a lot of imagination.

Canvas

This course utilizes canvas. Make sure you sign up and enroll before the end of the first

week at <https://canvas.instructure.com/enroll/J4687M>.



Tentative Schedule

Don't bet your life-saving on this schedule.

Week 1	Introduction to Proof
Week 2	Induction I
Week 3	Induction II & Invariant
Week 4	Sum and Asymptotics & Recurrence
Week 5	Divide and Conquer
Week 6	Counting
Week 7	More Counting
Week 8	Probability
Week 9	Random Variable
Week 10	Expected Value
Week 11	Graph Theory
Week 12	Catch up or Special Topics