

Fall 2013, Math2721 – Concepts of Mathematics

Outline: The course is for beginning undergraduate math students. The main purpose of the course is to help students quickly and smoothly pass through the transition from high school level math to university style math. Emphasis will be put on solid training of understanding concepts and logic proofs rather than memorizing results and routine calculations. The course may be particularly useful to students who have difficulty to write formal mathematical proofs in English.

<u>Instr/Tutor</u>	<u>Office</u>	<u>Lecture/Tutorial Hour</u>	<u>Venue</u>
Beifang Chen	Rm3470	L: WF, 1:30pm-2:20pm Office Hour: F, 4:00pm-6:00pm	Rm 6591
Xilin Li	Rm 3213	T: M, 6:00pm-6:50pm Office Hour: T: 12:00pm-2:00pm	Rm 4502

Textbook: *A Concise Introduction to Pure Mathematics*
by Martin Liebeck
Chapman & Hall/CRC Mathematics 2000

Homework, quiz, and exam: Homework will be assigned weekly but will not be collected. Quizzes are given biweekly. Everyone must attend each quiz without exception. There is no final exam.

Grading: Quiz 100%. There are about 5-6 quizzes, each is equally weighted.

Tentative Schedule

Week 1-2	Sets and proofs; counting and choosing; more on sets (Ch. 1, 17, 18)
Week 3-4	Number systems; decimals; inequalities (Ch. 2, 3, 4)
Week 5-6	Complex numbers; roots of unity; polynomials (Ch. 5, 6, 7)
Week 7-8	Induction; Euler's formula; introduction to analysis (Ch. 8, 9, 10)
Week 9-10	Integers; prime factorization; more on prime numbers (Ch. 11, 12, 13)
Week 11-12	Congruence of integers; equivalence relations (Ch. 14, 19)
Week 13-14	Functions; infinity (Ch. 20, 21)

Intended Learning Outcomes

By completing the course, students should be able to

- adapt to the university level and style of study on math courses, and to prepare himself or herself to further study more advanced math courses in the next three years.
- master basic concepts of mathematics such as set system, functions, logic argument, proof of methods, mathematical induction, number system (integers, rational numbers, real and complex numbers) and its application, counting principles, and equivalence relations.
- improve the use of correct mathematical terminology and writing of mathematical proof.