**MATH 3131** Honors in Linear and Abstract Algebra II

**Course Outline Spring 2019-2020**

* **Instructor(s)**

*Name: Professor Yongchang Zhu*

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* **Teaching Assistant(s)**

*Name: Mr. Kailong Gao*

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* **Meeting Time and Venue**

*Lectures:*

**Date/Time:** Tuesday and Thursday, 16:30 – 17:50

**Venue:**  Zoom Online and Room 6573

*Tutorials:*

**Date/Time:** Thursday, 15:00-15:50

**Venue:**  Zoom online and Room 1511

* **Course Description**

Credit Points: 3

Pre-requisite: MATH 2131 Honors in Linear and Abstract Algebra I

Exclusion: NIL

Brief Information/synopsis:

This course is for honored students. It is continuation of Honors in Linear and Abstract Algebra I. It covers basic concepts and theorems on abstract algebra including groups, rings, modules and fields.

* **Intended Learning Outcomes**

Upon successful completion of this course, students should be able to:

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| No. | ILOs |
| 1 | Recognize and use appropriately important technical terms and definitions. |
| 2 | Use algebraic techniques to formulate and apply the fundamental theorems in concise form. |
| 3 | Understand and apply the basic concepts and theorems in abstract algebra. |
| 4 | Understand and apply the techniques of abstract algebra. |
| 5 | Able to write rigorous proof |

* **Assessment Scheme**
* Homeworks
* Examinations

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| Assessment | Assessing Course ILOs |
| 40% Homework | 1, 2, 3, 4 |
| 10% Midterm | 1, 2, 3, 4 |
| 50% Final | 1, 2, 3, 4 |

* The grading is assigned based on students’ performance.
* **Student Learning Resources**

Recommended Reading:

Text(s): M. Artin, “Algebra”, 2nd edition.

* **Teaching and Learning Activities**

Scheduled activities: 4 hrs (lecture + tutorial)

* **Course Schedule**

Keyword Syllabus:

* Group, subgroup, quotient group, product group, homomorphism, isomorphism
* Ring, polynomial ring, homomorphism, ideals, quotient ring, fraction
* Module, free module, generator and relation, Noetherian ring, structure of Abelian group, linear transformation
* Field, algebraic element, transcendental element, field extension, irreducible polynomial, finite field