

# MA4548: ABSTRACT ALGEBRA II

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## Effective Term

Semester A 2025/26

## Part I Course Overview

### Course Title

Abstract Algebra II

### Subject Code

MA - Mathematics

### Course Number

4548

### Academic Unit

Mathematics (MA)

### College/School

College of Science (SI)

### Course Duration

One Semester

### Credit Units

3

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

MA3523 Introduction to Abstract Algebra

### Precursors

Nil

### Equivalent Courses

Nil

### Exclusive Courses

Nil

## Part II Course Details

Abstract

This course is a continuation of MA3523 (Introduction to Abstract Algebra). The purpose of this course is to teach undergraduate student the fundamental concepts in abstract algebra, which are rings, factorization and modules.

### Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the concepts of rings, ideals, homomorphism between rings and quotient rings	33	x	x	
2	Factorization of integers and polynomials	33	x	x	
3	Explain the concepts of modules, generators and application to linear operator	34		x	x

#### A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

#### A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

#### A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

### Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Learning through teaching	Learning through teaching is primarily based on lectures	1, 2, 3	39 hours in total
2	Learning through take-home assignments	Learning through take-home assignments helps students understand basic concepts and theories of group, vector space with abstract field, and linear transformations.	1, 2, 3	After-class

### Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?	
1	Test	1, 2, 3	30	Questions are designed for the first part of the course to see how well students have learned the concepts and theories of rings and ideals.	No

2	Formative take-home assignments	1, 2, 3	20	The assignments provide students chances to demonstrate their achievements on abstract algebra learned in this course.	Yes
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**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

2

**Minimum Examination Passing Requirement (%)**

30

**Additional Information for ATs**

50% Coursework 50% Examination (Duration: 2 hours, at the end of the semester) For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

**Assessment Rubrics (AR)****Assessment Task**

1. Test

**Criterion**

Capacity to study basic properties of rings, ideals, factorization and modules

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Assessment Task**

2. Formative take-home assignments

**Criterion**

Ability to understand basic concepts of rings, ideals, factorization and modules

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Assessment Task**

3. Final Examination

**Criterion**

Ability to solve technical problems relevant to rings, ideals, factorization and modules

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Part III Other Information****Keyword Syllabus**

Rings, ideals, quotient rings, factorization, Gauss' s lemma, modules, generators

**Reading List****Compulsory Readings**

Title	
1	“Algebra” by Michael Artin, Pearson (2rd edition), 2010.

**Additional Readings**

Title	
1	Nil