Marshall University
Syllabus

Course / Title Number	MTH 452/552 - Modern Algebra II
Semester/Year	Spring 2018
Days/Time	MWF 8am – 8:50am
Location	Smith 511
Instructor	Dr. Michael Schroeder
Office	Smith 742F
Phone	(304) 696-6643
E-Mail	schroederm@marshall.edu
Office/Hours	MTWRF 10am – 11am
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Rights and Responsibilities of Students Academic Dishonesty Excused Absence Policy for Undergraduates Affirmative Action Academic Probation and Suspension Inclement Weather Computing Services Acceptable Use Sexual Harassment Students with Disabilities Dead Week Academic Forgiveness

Course Description: From Catalog

> Topics discussed will include: Rings, integral domains, ideals and factor rings, ring homomorphisms, polynomial rings, unique factorization domains, vector spaces, extension fields, algebraic extensions, and finite fields.

The table below shows the following relationships:

How each student learning outcomes will be practiced and assessed in the course.

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course
Students will ...		
further practice with various methods of proof	in-class assignments and homework	exams
become familiar with different types of rings and fields and their properties	in-class assignments and homework	exams
learn about mappings between rings (homomorphisms).	in-class assignments and homework	exams
receive an introduction to field theory.	in-class assignments and homework	exams

Required Texts, Additional Reading, and Other Materials

1. Gallian, *Contemporary Abstract Algebra*, 8th Edition, ISBN 978-1133599708.

Course Requirements / Due Dates

1. Exam 1: 2/2/2018
2. Exam 2: 3/2/2018
3. Exam 3: 4/6/2018
4. Final: 4/30/2018

Grading Policy

Mastery-Level Grading

In this course, we will use **non-quantitative** grading system. Rather than receiving a number on any given problem or assignment, you will receive one of the following *levels of mastery:*

•**Graduate Mastery (GM)**: the level of mastery expected for an A in a graduate course.

•**Undergraduate mastery (UM)**: the level of mastery expected for an A in an upper-level undergraduate course.

•**Partial mastery (PM)**: a beginning level of mastery that does not reach the level of undergraduate mastery.

•**Not meeting expectations (NE)**: assigned to assignments that are incomplete or contain significant errors.

•**No submission (NS)**: assigned when an assignment was not submitted, or was extremely incomplete.

Classwork & Homework

There will be a problem set distributed every class meeting. Portions of this assignment will be due after two class periods. These assignments will be assessed using the grading rubric at the end of the syllabus. Assignments will be submitted through the Blackboard course homepage on MU Online. Graduate student homework must be typeset using LaTeX.

If you receive a grade of **NE** or **NS** on an assignment, you may resubmit *once* for regrading. For this privilege, you must come speak to me in my office within a class day of receiving your grade. You will have until the second class meeting after discussing things in office hours to resubmit the assignment.

Grade Scale

The following table indicates how grades will be administered at the end of the semester:

Level	Grade for undergraduates	Grade for graduates
GM / Graduate mastery	A	A
UM / Undergraduate mastery	A	B
PM / Partial mastery	B	C
NE / Not meeting expectations	C	D
NS / No Submission	F	F

Attendance Policy

You are responsible for everything that is said and covered in class each day. Attendance is strongly recommended. Attendance and participation will be key factors in border-line grades getting bumped. Graduate students will be required to present problems throughout the semester.

Course Topics

Course Schedule

MTH 452/552: Modern Algebra II

Specific Class Information

Semester:	Spring 2018		
CRN:	3971 (201) MTH 452	**Instructor:**	Dr. Michael Schroeder
	3983 (201) MTH 552	**Email:**	schroederm@marshall.edu
		Office (Phone):	Smith Hall 742F, (304) 696-6643
Meeting:	MWF 8:00AM - 8:50AM	**Classroom:**	Smith Hall 511
Office Hours:	MTWRF 10:00AM - 11:00AM		

Required Text: Gallian, *Contemporary Abstract Algebra*, 8th Edition, ISBN 978-1133599708.

Prerequisites: Math 450 or 550

Learning Outcomes, Methods, and Assessment

Each learning outcome is listed below. Students will complete homework and graduate students will present problems to practice these skills. Assessment will be done through midterm and final exams.

Desired MTH 452 Learner Outcomes/Objectives

Successful students will ...

- ▸ further practice with various methods of proof
- ▸ become familiar with different types of rings and fields and their properties
- ▸ learn about mappings between rings (homomorphisms).
- ▸ receive an introduction to field theory.

Course Description

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Course Policies (continued)

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Exams

We will have two mid-term exams and a final exam in this course. Their dates are the following:

Exam 1	Friday, February 2, 2017
Exam 2	Friday, March 2, 2017
Exam 3	Friday, April 6, 2017
Final Exam	Monday, April 30, 2017

Graduate students will have an oral portion for the final, to be scheduled in the last week of the semester. An unexcused absence for an exam will result in a **zero (0)** for that grade. An excused absence as determined by the Office of Student Affairs (location at MSC2W38) will warrant a makeup exam.

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University-Wide Policies

You are responsible for knowing all university policies, which can be found at

`http://www.marshall.edu/academic-affairs/?page_id=802`

Rubrics

Mastery Rubric

Below are the indicators for which grades will be given on your work in this class:

	GM: Graduate Mastery	UM: Undergraduate Mastery	PM: Partial Mastery	NE: Not Meeting Expectations
Writing and clarity of expression	Writing displays extreme clarity of thought through the use of precise, non-verbose prose and appropriate use of mathematical symbolism. Proper mathematical terminology is used fluently throughout, in a manner demonstrating mastery of the meanings.	Writing displays clarity of thought through the use of clear prose and appropriate use of mathematical symbolism. Some paragraphs or sentences may be slightly unclear, verbose, or clunky. Rarely uses incorrect or clunky terminology; some use of terminology may not seem fluent.	Writing sometimes shows clarity of though, but at other times may be hard to follow or go off on tangents. Writing somethings uses too little prose (too much symbolism). Occasional misuses of mathematical terminology, but not in ways that seriously jeopardize the answer.	Writing is unclear so that the main argument is difficult to follow. A large number of proofs may have minimal prose (symbolic derivation only), or excessively verbose prose. Significant errors in mathematical terminology, or excessive avoidance of mathematical terminology.
Definitions	Able to recall all definitions from this course and previous courses. Able to state definitions clearly and precisely, and rephrase definitions for the problem at hand.	Able to recall all definitions from this course, and state the definitions clearly and precisely, with rare errors of limited significance. Can restate some definitions from the problem at hand, but may rely on rote memorization for stating some definitions.	Able to recall all definitions from the course, with occasional minor errors, and to state the definitions clearly and precisely. May rely on rote memorization. May struggle to apply definitions in proofs.	Unable to recall definitions from the course. Some definitions are stated with significant errors.
Proofs	Proofs are correct and straightforward to follow, with clear organization. There are no logical or quantifier errors. All variables are clearly introduced. All proofs are at level 9 or 10 on the proof rubric. Straightforward proofs are at level 10 of the proof rubric.	Proofs are almost entirely correct, and are straightforward to follow, with clear organization. All variables are clearly introduced. Most proofs are at level 9 or 10 on the proof rubric; few are at level 7 or below.	Proofs have occasional errors, but generally not insurmountable ones. Proofs may appear to be rushed or unrevised. Many proofs are at level 8 or higher on the proof rubric; few are at level 6 or below.	Many proofs have significant errors. Majority of proofs at level 6 to 8 of the proof rubric, although few proofs may be higher.
Examples	Able to recall all examples seen in class, and determine additional properties of the examples. Able to construct new examples, some of which may be challenging.	Able to recall all examples seen in class, and to determine simple additional properties of the examples. Able to construct simple new examples by analogy with known examples.	Able to recall most examples from class, although perhaps with minor errors. Unable to determine some simple properties of these examples. Unable to construct new examples.	Unable to recall many examples seen in class. Examples may be recalled with significant errors. Unable to determine new properties of already-seen examples.

Rubrics (continued)

<u>**Proof Rubric**</u>

Below are the indicators for which grades will be given on your work in this class:

	Surface Features	Mathematical Writing	Logical Reasoning
10 **Mastery**	The problem is clearly stated. Grammar and spelling errors are rare. The formatting matches the submission guideline.	Variables are property introduced before they are used. The use of quantifiers is clear. All symbols and terminology are used appropriately. The proof is written in polished prose.	The logical reasoning is correct and is clearly explained. The proof is complete: all cases have been examined, all significant steps have been justified, and all assumptions have been clearly stated. The proof is clearly organized and the argument is easy to follow.
8 **Partial Mastery** **(high)**	The problem is clearly stated. Grammar and spelling errors, if present, do not distract from the content. The formatting matches the submission guidelines.	Some variables are used without being introduced. Symbols and terminology are used appropriately, with rare exceptions. The proof is written in prose.	The logical reasoning is essentially correct, although some parts are not clearly explained. Only minimal revision would be needed to correct the reasoning. All cases have been examined, all significant steps have been justified, and all assumptions have been clearly stated. The proof is organized well enough that the structure of the argument is clear.
6 **Partial Mastery** **(low)**	The problem is clearly stated. Grammar and/or spelling errors distract from the content. The formatting does not meet the submission guideline.	Some variables are used without being introduced. Some symbols or terminology are used incorrectly. The build of the proof is written in prose.	The logical reasoning has a flaw that requires rewriting part of the argument. The proof is not complete: some case has not been exampled, a significant step has not bee unjustified, or an unspoken assumption has been made. Some parts of the argument are not clearly explained. The organization makes it difficult to discern the structure of the argument.
5 **Not Meeting** **Expectations**	The statement of the problem is missing or unclear. Grammar and/or spelling errors distract from the content. The formatting does not meet the submission guideline.	Some variables are used with being introduced. Some symbols are used inappropriately, or some terminology is used incorrectly. The proof is not written in prose form.	The logical reasoning has a serious flaw or multiple minor flasw. Significant revision is required to correct the argument. The proof is not complete: some case has not been examined, a significant step has not been justified, or an unspoken assumption has been made. Some parts of the argument are not clearly explained. The proof is not well organized.
0 **No Submission**	No solution is submitted, or the solution does not make progress on the assigned problem.		

Rubric (continued)

Combining Rubric

To yield a specific letter grade in this course, you must achieve one of the following:

Grade	Requirements
GM	Grades must satisfy all of the following requirements: ▸ At least 50% of homework grades at the GM level, and at least two major assignments are GM; or all major assignment grades are GM. ▸ There are no more than four PM homework grades. ▸ There are no PM grades on major assignments. ▸ There are no NE or NS grades. ▸ Absent from fewer than three class periods.
UM	Grades must satisfy all of the following requirements: ▸ At least 50% of homework grades at the UM level or higher, and at least two major assignments are UM or higher; or all major assignment grades are UM or higher. ▸ There are no more than three NE homework grades. ▸ There are no NE grades on major assignments. ▸ There are no NS grades. ▸ Absent from fewer than four class periods. Note: There may be some GM grades, but the overall standard for GM is not met.
PM	Grades must satisfy all of the following requirements: ▸ At least 50% of homework grades at the PM level or higher, and at least two major assignments are UM or higher; or all major assignment grades are PM or higher. ▸ There are no more than two NS homework grades. ▸ There are no NS grades on major assignments. ▸ There are no NS grades. ▸ Absent from fewer than six class periods. Note: Some grades may higher than PM, but the overall standard for GM or UM is not met.
NE	Grades must satisfy all of the following requirements: ▸ There are no more than two NS homework grades. ▸ There are no NS grades on major assignments. ▸ Absent from fewer than eight class periods. Note: There may be some grades higher than NE, but the overall standard for GM, UM, or PM is not met.
NS	The overall standard for GM, UM, PM, or NE is not met.