

# Syllabus

**MATH-502:** Abstract Algebra

**Course dates:** 3/2/20 – 4/26/20

**Written By:** Dr. Robert F. Morse

## Course Description

This course is a study of algebraic structures and major theorems for these. Group theory and ring theory are reviewed and further developments are presented. An introduction to field theory and Galois theory is included. Prerequisite: A bachelor's degree with a Mathematics major or must be state certified (in any state) to teach Mathematics at a secondary school level.

Credit Hours: 3

Prerequisite Courses: None

**Prerequisite Skills and Knowledge:** Candidates who meet program acceptance requirements possess the necessary skills and knowledge for this course.

## Course Outcomes

**Upon completion of this course, you should be able to:**

1. Construct clear and correct proofs connected to the class material.
2. Categorize given algebraic structures as groups, rings, and fields.
3. Integrate how groups, rings, fields, and Galois Theory connect to each other and to previous mathematical understanding.
4. Distinguish among methods given in course in solving given problems.
5. Explain reasoning and motivation for proofs/explanations in text and proofs/solutions done for given problems.
6. Illustrate how creation's orderly nature is reflected in symmetry and other topics of this class.

## Course Textbook

Gallian, J. A. (2011). *Contemporary Abstract Algebra* (9th ed.). Boston, MA: Cengage Learning. ISBN-13: 9781305657960

Gallian, J. (2016). Student Solutions Manual for *Contemporary Abstract Algebra*, 9/e. Boston, MA: Cengage Learning.

## IWU Diversity Statement

IWU, in covenant with God's reconciling work and in accordance with the Biblical principles of our historic Wesleyan tradition, commits to build a community that reflects Kingdom diversity. We will foster an intentional environment for living, teaching and learning, which exhibits honor, respect, and dignity. Acknowledging visible or invisible differences, our community authentically values each member's earthly and eternal worth. We refute ignorance and isolation and embrace deliberate and courageous engagement that exhibits Christ's commandment to love all humankind.

## Grading Scale

<b>Grade</b>	<b>Quality Points Per Credit</b>	<b>Percentage</b>	<b>Score</b>
<b>A</b>	4.0	95%–100%	950–1000
<b>A-</b>	3.7	92%–94.9%	920–949
<b>B+</b>	3.3	89%–91.9%	890–919
<b>B</b>	3.0	85%–88.9%	850–889
<b>B-</b>	2.7	82%–84.9%	820–849
<b>C+</b>	2.3	79%–81.9%	790–819
<b>C</b>	2.0	75%–78.9%	750–789
<b>C-</b>	1.7	72%–74.9%	720–749
<b>D+</b>	1.3	69%–71.9%	690–719
<b>D</b>	1.0	65%–68.9%	650–689

<b>F</b>	0.0	0%–64.9%	0–649
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## Grading Policies

Your grading policy for your course is dependent on your school and program. Your grading policies can be found in the IWU Catalog.

## Letter Grade Equivalencies

<b>Grade</b>	<b>Description of Work</b>
<b>A</b>	Clearly stands out as excellent performance. Has unusually sharp insights into material and initiates thoughtful questions. Sees many sides of an issue. Articulates well and writes logically and clearly. Integrates ideas previously learned from this and other disciplines. Anticipates next steps in progression of ideas. Example "A" work should be of such nature that it could be put on reserve for all cohort members to review and emulate. The "A" cohort member is, in fact, an example for others to follow.
<b>B</b>	Demonstrates a solid comprehension of the subject matter and always accomplishes all course requirements. Serves as an active participant and listener. Communicates orally and in writing at an acceptable level for the degree program. Work shows intuition and creativity. Example "B" work indicates good quality of performance and is given in recognition for solid work; a "B" should be considered a good grade and awarded to those who submit assignments of quality less than the exemplary work described above.
<b>C</b>	Quality and quantity of work in and out of class is average. Has marginal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at least minimally.
<b>D</b>	Quality and quantity of work is below average. Has minimal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at below acceptable levels.
<b>F</b>	Quality and quantity of work is unacceptable and does not qualify the student to progress to a more advanced level of work.

## Course Module Summary

Module	Discussion	Assignment	Test	Total Points
<b>Module One</b>	2/40	1/70		110
<b>Module Two</b>	1/20	1/70		90
<b>Module Three</b>	2/40	1/70		110
<b>Module Four</b>	1/20	1/70	1/100	190
<b>Module Five</b>	2/40	1/70		110
<b>Module Six</b>	1/20	1/70		90
<b>Module Seven</b>	2/40	1/70		110
<b>Module Eight</b>	1/20	1/70	1/100	190
<b>TOTAL</b>	<b>12/240</b>	<b>8/560</b>	<b>2/200</b>	<b>1000</b>

\* Number of Activities/Sum Point Totals

## Pacing Guides

- Module 1 is due by the end of Week 1.
- Module 2 is due by the end of Week 2.
- Module 3 is due by the end of Week 3.
- Module 4 is due by the end of Week 4.
- Module 5 is due by the end of Week 5.
- Module 6 is due by the end of Week 6.
- Module 7 is due by the end of Week 7.
- Module 8 is due by the end of Week 8.

## Module One Outline

<b>Title</b>	<b>Type</b>	<b>Due Dates</b>	<b>Time</b>	<b>Points</b>
<b>1.1 Biblical Wisdom</b>	Discussion	Initial Post required by the middle of the module; two responses due by the end of the module.	2 hours	20
<b>1.2 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>1.3 Module One Problems</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>			<b>11 hours*</b>	<b>110</b>

## **Module Two Outline**

<b>Title</b>	<b>Type</b>	<b>Due Dates</b>	<b>Time</b>	<b>Points</b>
<b>2.1 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>2.2 Module Two Problems</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>			<b>9 hours*</b>	<b>90</b>

## **Module Three Outline**

<b>Title</b>	<b>Type</b>	<b>Due Dates</b>	<b>Time</b>	<b>Points</b>
<b>3.1 Biblical Wisdom</b>	Discussion	Initial Post required by the middle of the module; two responses due by the end of the module.	2 hours	20
<b>3.2 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>3.3 Module 3 Problems</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>			<b>11 hours*</b>	<b>110</b>

## **Module Four Outline**

<b>Title</b>	<b>Type</b>	<b>Due Dates</b>	<b>Time</b>	<b>Points</b>
<b>4.1 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>4.2 Module 4 Homework</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>4.3 Exam I</b>	Dropbox	Due by the end of the module.	4 hours	100
<b>Totals</b>			<b>13 hours*</b>	<b>190</b>

## Module Five Outline

Title	Type	Due Dates	Time	Points
<b>5.1 Biblical Wisdom</b>	Discussion	Initial Post required by the middle of the module; two responses due by the end of the module.	2 hours	20
<b>5.2 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>5.3 Workshop 5 Homework</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>			<b>11 hours*</b>	<b>110</b>

## Module Six Outline

Title	Type	Due Dates	Time	Points
<b>6.1 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>6.2 Module 6 Homework</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>				

## Module Seven Outline

Title	Type	Due Dates	Time	Points
<b>7.1 Biblical Wisdom</b>	Discussion	Initial Post required by the middle of the module; two responses due by the end of the module.	2 hours	20
<b>7.2 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>7.3 Module 7 Homework</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>Totals</b>			<b>11 hours*</b>	<b>110</b>

## Module Eight Outline

Title	Type	Due Dates	Time	Points
<b>8.1 Discussion</b>	Discussion	Posting your initial question, problem, or problem solution, and responding to at least two of your classmates' postings by the end of the fourth day of the module will earn the Complete status.	2 hours	20
<b>8.2 Module 8 Homework</b>	Dropbox	Due by the end of the module.	7 hours	70
<b>8.3 Exam II</b>	Dropbox	Due by the end of the module.	4 hours	100



<b>8.4 End of Course Survey</b>	Dropbox	Due by the end of the module.	30 minutes	0
<b>Totals</b>			<b>11 hours*</b>	<b>190</b>