<table>
<tr><td>A</td><td>Course Title & Number</td><td>ABSTRACT ALGEBRA I - MTH 530</td></tr>
<tr><td>B</td><td>Pre/Co-requisite(s)</td><td>Admission to MSMTH program</td></tr>
<tr><td>C</td><td>Number of credits</td><td>3</td></tr>
<tr><td>D</td><td>Faculty Name</td><td>Ayman Badawi</td></tr>
<tr><td>E</td><td>Term/ Year</td><td>Fall 2017</td></tr>
<tr><td>F</td><td>Sections</td><td>
<table>
<tr><th>Section</th><th>Days</th><th>Time</th><th>Instructor</th><th>Location</th></tr>
<tr><td>Section I</td><td></td><td></td><td>Ayman Badawi</td><td></td></tr>
</table>
</td></tr>
<tr><td>G</td><td>Instructor Information</td><td>
<table>
<tr><th>Instructor</th><th>Office</th><th>Telephone</th><th>Email</th></tr>
<tr><td>Ayman Badawi</td><td>Nab 262</td><td></td><td>abadawi@aus.edu</td></tr>
</table>
<u>Office Hours:</u> TRU: 14-14:50. Others by appointment. Just email me for an appointment
</td></tr>
<tr><td>H</td><td>Course Description from Catalog</td><td>Covers basic concepts in group theory with examples and theorems, Krull-Schmidt theorem, groups acting on sets, cosets, stabilizers, Sylow’s theorems, free groups, and classification of finitely generated abelian groups, nilpotent and solvable groups. Introduces rings and fields.</td></tr>
<tr><td>I</td><td>Course Learning Outcomes</td><td>Upon completion of the course, students will be able to:
1. Write mathematical proofs and reason abstractly in exploring properties of groups.
2. Use the division algorithm, Euclidean algorithm, and modular arithmetic in computations and proofs about the integers.
3. Construct examples of, and explore properties of groups, including symmetry groups, permutation groups and cyclic groups.
4. Determine subgroups and factor groups of finite groups.
5. Use and apply homomorphisms between groups.</td></tr>
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6. Use theorems of the course to analyze the structure of groups and demonstrate an understanding of the nature of pure mathematics, including how it is structured and developed.
7. Perform calculations and proofs using Sylow theorems.

J Textbook and other Instructional Material and Resources

Class Notes (Very crucial). It heavily relies on class notes. Materials on I-Learn. My personal webpage(for old HW's, Exams, and Finals)

http://www.ayman-badawi.com/MTH%20530.html

(Optional) Title: *Abstract Algebra*- Third Edition

Author: David S. Dummit and Richard M. Foote

Publisher: Joyn Willey & Sons Inc.

K Teaching and Learning Methodologies

Standard white board teaching and markers.

L Grading Scale, Grading Distribution, and Due Dates

Grading Scale

A:85--100 A-: 81--84.99 B+: 77-- 80.99 B: 74 -- 76.99 B-: 70 – 73.99 C+: 67 - - 69.99 C: 63—66.99 F: <63

Excellent	
A	Equals 4.00 grade points
Meet Expectation	
A-	Equals 3.80 grade points
B+	Equals 3.30 grade points
B	Equals 3.00 grade points
Below Expectation	
B-	Equals 2.70 grade points
C+	Equals 2.30 grade point
C	Equals 2.00 grade point
Fail	
F	Equals 0.00 grade points
Academic Integrity Violation Fail	
XF	Equals 0.00 grade points
Withdrawal Fail	

WF	Equals 0.00 grade points

Assessment	**Weight**	**Due Date**
Homework	22%	TBA
Two Exams	44%	**TBA**
Final Exam(Comprehensive)	34%	**Final Exam Week**
Total	100%	

M Explanation of Assessments	• Late assignments, if and when accepted, will result in **20% deduction per day per assignment** regardless of the reasons. • A missed exam might be replaced with the grade of the final exam and/or the average grade of all tests, and homework assignments.
N Student Academic Integrity Code Statement	Student must adhere to the Academic Integrity code stated in the 2013-2014 graduate catalog.

SCHEDULE

(Optional if you choose to use the text book)Math 530 – Abstract Algebra I
Course Syllabus / Weekly Schedule

Section	**Material**	**Number of Weeks**
0.1, 0.2, 0.3	**Basics, Properties of the integers, The integers *mod n* (Z_n)**	**1**
1.1, 1.2, 1.3, 1.4	**Basic Axioms and definition of a group, Dihedral groups, Symmetric groups, Matrix groups**	**1**
1.5, 1.6, 1.7	**The Quaternion group, Homeomorphisms and isomorphism, Groups actions**	**1**

2.1, 2.2, 2.3	**Definition of subgroups, Centralizers and Normalizers, Stabilizers and Kernels**	**1**
2.3, 2.4, 2.5	**Cyclic groups and cyclic subgroups, subgroups generated by a subset of a group, The lattice of subgroups**	**1**
3.1, 3.2, 3.3	**Introduction to quotient groups, Cosets and Lagrange's Theorem, The isomorphism theorem**	**1**
3.4, 3.5	**Composition series and Holder program, Transpositions and the Alternating group**	**1**
Review and Exam 1		**1**
4.1, 4.2, 4.3	**Group actions and permutation representations, Groups acting on themselves, Cayley's Theorem**	**1**
4.4, 4.5, 4.5	**Groups acting on themselves by conjunction, Automorphisms, Sylow's Theorem**	**1**
4.6, 5.1	**The simplicity of An, Direct products**	**1**
5.2, 5.3	**The fundamental theorem of finitely generated abelian groups, Table of groups of small order**	**1**
6.1	**P-groups, Nilpotant groups and Solvable groups**	**1**
Review and Exam 2		**1**
7.1, 7.2	**Introduction to rings and Examples**	**1**
Final Exam	**Final Exam**	**1**