



University of Bahrain
Quality Assurance
& Accreditation Center



Course Syllabus Form	
1. College	Science
2. Department	Mathematics
3. Program	B.Sc. in mathematics
4. Course Code	MATHS 311
5. Course Title	Abstract Algebra 1
6. Course Credits	3
7. Pre-requisites	MATHS 211
8. Course webpage	http://www.abdullaaid.net/MATHS311
9. Course Coordinator	Dr. Abdulla Eid
10. Academic Year	2017/2018
11. Semester	First
12. Course Description:	Groups. Homomorphisms. Subgroups. Cyclic Groups. Permutation Groups, Groups of Symmetries. Lagranges Theorem. Normal Subgroups. Quotient Groups. Fundamental Theorem of Group Homomorphisms. Conjugacy. Sylows Theorems. Direct Products
13. Textbook:	<ul style="list-style-type: none">• J.B. Fraleigh, <i>First course in abstract algebra</i>, 2002, 7th Edition, Pearson, ISBN-13: 978-0201763904
14. References:	<ol style="list-style-type: none">1. J. Gallian, <i>Contemporary abstract algebra</i>, 2016, 9th Edition, Cengage Learning, ISBN-13: 978-1305657960.2. D.S. Dummit and R.M. Foote, <i>Abstract algebra</i>, 2004, 3rd Edition, Wiley, ISBN-13: 978-8126532285.3. T.W. Hungerford, <i>Abstract algebra: An introduction</i>, 2012, 3rd Edition, Cengage Learning, ISBN-13: 978-1111569624.
15. Other Resources:	The instructor's lecture notes that will be given in the class.

16. Course Intended Learning Outcomes (CILOs):											
Students who successfully complete this course should be able to:											
	Mapping to PILOs										
CILOs	a	b	c	d	e	f	g	h	i	j	k
1. Assess properties implied by the definitions of groups	✓	✓									
2. Compute the order of element, order of subgroup, and the order of finite group	✓	✓									
3. Use and understand the structure and characteristics of various canonical types of groups including cyclic groups, group of symmetries and groups of permutations	✓	✓									
4. Analyze and demonstrate examples of subgroups, normal subgroups factor groups, and direct product	✓	✓									
5. Use the concepts of isomorphism and homomorphism for groups	✓	✓									
6. Apply the fundamental theorem of finite abelian groups to classify all finite abelian groups up to isomorphism	✓	✓									
7. Use Sylows theorems to describe the structure of certain finite groups	✓	✓									
8. Produce rigorous proofs of propositions arising in the context of group theory	✓	✓				✓					

17. Course Assessment:			
Assessment Type	Number	CILOs	Weight
Test	1	CILOs 1,2,3,4,8	25%
Project	1	1 – 8	10%
Homework	14	All CILOs	25%
Final Exam	1	All CILOs	40%

18. Assessments Details:						
No	Assessment	Weight	Time	Date	Place	Material
1	Midterm exam	25%	TBA	TBA	TBA	TBA
2	Project	10%	-	Written report due December 24, 2017	-	-
3	Homework	25%	-	Weekly	-	All Sections
4	Final Exam	40%	11:30 AM – 1:30 PM	15.1.2017	TBA	All sections

19. Course Instructor:		
Section(s)	Instructor	Office
1	Dr. Abdulla Eid (aeid@uob.edu.bh)	S41-2098

20. Attendance Policy:

Extracts from the University Bulletin regarding withdrawal and enforced withdrawal (Article 31):

A student's absence from lectures or classes in excess of 25% of the total assigned session will result in an automatic withdrawal of the student from the course, regardless of the causes for his/her absence.

- (a) A grade of (W) is given to a student who misses 25% or more of the total sessions assigned to the course if he/she presents a valid excuse for his/her absence.
- (b) A grade of (WF) is given to a student who misses 25% or more, but with no valid excuse.

The classroom environment should be conducive to learning by all. This means, among other things, coming to class on time and prepared. Please no chit-chat talks during the class. Cell phones, graphical calculators and all electronic devices should be turned off and put away during the class and in the exams.

21. Academic Plagiarism:

All students are expected to follow the specific rules of academic honesty and plagiarism as per the regulation of professional conduct violations for University of Bahrain students, decision number 4/2006. Please refer the UoB website-Deanship of Students Affairs-Guidance Office.

Cheating is strictly prohibited and will result in serious consequences. In particular, cheating may result in an "F" for the course and be reported to deanship of students affairs. Using of any outside materials, looking at another student's exam or using cell phones might be considered as cheating (whether or not you get benefit from it). For more information, refer to the student handbook (Article 75).

22. Important Dates:

- Sept 17, 2017: First day of the semester (Instruction begins).
- Sept 28, 2017: Last day to drop courses without a 'W' grade.
- Nov 5 – 9 , 2017: The mid semester break.
- Dec 7, 2017: Last day to withdraw with a 'W' grade.
- Jan 4, 2018: Last day of instruction.
- Jan 15, 2018: Final exam.

23. Weekly Breakdown:

Week	Date	Topics Covered	CILOs	Teaching Method	Assessment
1	17.09.2017	The integers Modular arithmetics	1	Lecture and problem- solving	HW 1, Test 1, Final Exam

23. Weekly Breakdown:					
Week	Date	Topics Covered	CILOs	Teaching Method	Assessment
2	24.09.2017	Groups.	1,2	Lecture and problem-solving	HW 2, Test 1, Final Exam
3	01.10.2017	Subgroups	1,2,4,8	Lecture and problem-solving	HW 2, Test 1, Final Exam
4	08.10.2017	Cyclic groups	3,8	Lecture and problem-solving	HW 3, Test 1, Final Exam
5	15.10.2017	Group of permutations	3,8	Lecture and problem-solving	HW 4, Test 1, Final Exam
6	22.10.2017	Cosets and Lagrange's theorem	4	Lecture and problem-solving	HW 4, HW5, Test 1, Final Exam
7	29.10.2017	Normal Subgroups and factor groups	4,8	Lecture and problem-solving	HW 6, Test 2, Final Exam
	05.11.2017	Mid semester break.			
8	12.11.2017	Normal Subgroups and factor groups	4,8	Lecture and problem-solving	HW 6, HW 7, Test 2, Final Exam
9	19.11.2017	Group homomorphisms	5	Lecture and problem-solving	HW 8, Test 2, Final Exam
10	26.11.2017	Cayley's theorem Isomorphism theorems	3,5,8	Lecture and problem-solving	HW 9, Test 2, Final Exam
11	03.12.2017	Isomorphism theorems	5,8	Lecture and problem-solving	HW 10, Test 2, Final Exam
12	10.12.2017	Direct Product	4	Lecture and problem-solving	HW 11, Final Exam
13	17.12.2017	Fundamental theorem of finite abelian groups	6	Lecture and problem-solving	HW 10, Test 2, Final Exam
14	24.12.2017	Conjugacy classes and the class equation	8	Lecture and problem-solving	Final Exam
15	31.12.2017	Sylow's theorems	7	Lecture and problem-solving	Final Exam

24. Grades		
Letter Grade	Percentage Equivalent	Grade Point Value

A	90 – 100	4.00
A-	87 – 89	3.67
B+	84 – 86	3.33
B	80 – 83	3.00
B-	77 – 79	2.67
C+	74 – 76	2.33
C	70 – 73	2.00
C-	67 – 69	1.67
D+	64 – 66	1.33
D	60 – 63	1.00
F	Below 60	0.00

25. Course Project:

The course project is an independent self-learning assignment that will enhance your understanding of the course material. You will choose to study one of the following suggested topics:

- Monoids into groups.
- Group maps from \mathbb{Z}_n into \mathbb{Z}_m
- Burnstein's counting theorem with its applications
- Dihedral groups
- Group of symmetries
- Solvable and nilpotent groups
- Finitely generated abelian groups

You will need to submit a well written report (typed) of what you have learned in a lecture style notes by Sunday December 24, 2017. This will consist of only 5% of your total grade. The other 5% will be for an oral assessment of what you have written in the report and that will be scheduled during the weeks starting with Dec 24 and Dec 31.