QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Mathematics Department

Study plan No.	**2021/2022**		**University Specialization**	**Master of Math.**	
Course No.	**0101721**		**Course name**	Abstract Algebra (1)	
Credit Hours	**3**		**Prerequisite/ Co-requisite**		
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	✓ **Mandatory requirements**	☐ Elective requirements
Teaching style	☐ Full online learning		☐ Blended learning		✓ **Traditional learning**	
Teaching model	☐ 1 Synchronous: 1 asynchronous		☐ 1 face to face : 1 asynchronous		✓ **2 Traditional**	

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

Isomorphism theorems of groups, group automorphism, finite direct products, finitely generated groups, groups actions, Sylow theorems, rings and ideals, prime and maximal ideals, polynomial rings and irreducibity tests, unique factorization domains, Euclidean domains.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	Abstract Algebra An Introductory Course, by : Gregory T. Lee			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	• Abstract Algebra. By: I. N. Herstiein • Schaum's Outline of Group Theory 1st Edition, by B. Baumslag and, B. Chandler • Abstract Algebra. By: A. P. Hillman and G. W. Alexanderson • Groups, rings and field. By: T. S Blyth and E. F. Robertson.			
Supporting websites	• Abstract Algebra Notes- Free Harvard Courses. • Abstract Algebra Notes-You Tube. • http://www.ugrad.math.ubc.ca/coursedoc/math100/index.html • Online tutorials and quizzes			
The physical environment for teaching	✓ Class room	☐ labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software				
Supporting people with special needs				

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For technical support	

Course learning outcomes (S= *Skills, C= Competences K= Knowledge,)*

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Recognize advanced concepts in abstract algebra.	**MK1**
K2	Develop reading and writing proofs in abstract algebra.	**MK1**
K3	Discus a variety of examples and counterexamples in abstract algebr.	**MK1**
	Skills	
S1	Exercise abstract algebra research and scientific writing.	**MS2**
S2	Testing the scientific methodology as a way of thinking and a tool in facing algebra problems.	**MS3**
	Competences	
C1	Develop logical thinking and scientific algebric research methods.	**MC2**

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
First/Second exam	30%	30%	**30%**	30%
Participation / practical applications	0	0	**20%**	30%
Asynchronous interactive activities	30%	30%	**0**	0
Final exam	40%	40%	**50%**	40%

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	Introduction and review	Lecture	35-48
2	Finitely generated groups	Lecture	85-97
3	Cosets and Lagrange's theorem, properties of cosets.	Lecture	57-61
4	Transversal Groups	Lecture	61 – 64
5	More on Subgroups and cosets	Lecture	48-57
6	Normal Subgroups and Quotient Groups	Lecture	
7	Commutator Subgroups	Lecture	65-70
8	Map of Groups Isomorphisms, def. and examples. Properties of isomorphisms.	Lecture	69-78
9	Homomorphism Properties and Group of Automorphisms		69-78
10	Isomorphism theorems and application	Lecture	79-81
11	Mid exam	Lecture	210-215

12	Normal subgroups and factor groups. Normal subgroup test and Normal Structure	Lecture	115-119
13	Cauchy Theorems and abelian Sylow Theorems	Lecture	120-122
14	Sylow Theorems	Lecture	123-125
15	Rings, subrings, integral domain, factor rings and ideals.	Lecture	165-175
16	**Final Exam 50%**		