KEMENTRIAN RISET TEKNOLOGI DAN PENDIDIKAN TINGGI
UNIVERSITAS NEGERI YOGYAKARTA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
JURUSAN PENDIDIKAN MATEMATIKA

Lesson Plan

Study Program	:	Mathematics Education (S1)
Course/Code	:	Abstract Algebra/MAT6311
Semester	:	5
Prerequisite Course	:	Number Theory/MAT6205
Lecturer	:	Musthofa, M.Sc.
Languange	:	Bahasa Indonesia
Beban Kerja	:	Lectures are held for 16 meetings with each week consisting of 150 minutes of classroom lectures, 150 minutes structured assignments, and 150 minutes independent assignments.

Course Description
This course contains basic concepts of group, subgroup, permutation group, cyclic group, coset, Lagrange theorem, normal subgroup, factor group, group homomorphism and the main group homomorphism theorem.

Capaian Pembelajaran Lulusan (CPL) dan Capaian Pembelajaran Mata Kuliah (CPMK)
CPL 2. Menunjukkan tanggung jawab, kemampuan adaptasi, kemandirian, dan kepemimpinan dalam melaksanakan tugas
CPMK 1. `Demonstrate collaborative attitude and independence in carrying out individual tasks and group assignments`
CPL 3. Menunjukkan kecakapan komunikasi secara lisan dan tertulis serta keterampilan berkolaborasi
CPMK 2. `Show the truth of a problem related to the group and its properties through mathematical verification`
CPL 6. Menguasai secara komprehensif berbagai konsep matematika sekolah dan matematika lanjut
CPMK 3. `Mastering group concepts, group properties and group homomorphism`

CPL 7. Menerapkan konsep dasar pendidikan, konsep pedagogik-didaktik, atau konsep matematika sekolah maupun matematika lanjut untuk menyelesaikan masalah
CPMK 4. `Solve mathematical problems using group concepts and group properties`

Lesson Plan Description

Attitude learning (CPMK1) and general skills (CPMK2) are carried out at each meeting in an integrated manner in learning knowledge and skills. The implementation of knowledge learning (CPMK 3) and skills (CPMK 4) are described as follows.

Perte-muan ke-	CPMK	Bahan Kajian Pembelajaran	Bentuk/Metode Pembela-jaran	Pengalaman Belajar	Indikator Penilaian	Teknik Penilaian	Waktu	Refe-rensi
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	CPMK 3 CPMK 4	The definition and some examples of group	Discussion and problem solving	Find and make some examples of group	Provides an explanation of whether a set includes a group or not	- Observation - Assignment	1 x 150 menit	A, B, C, D
2	CPMK 3 CPMK 4	Group properties	Expository, discussion	Know and prove the properties of the group	Proving group properties	- Observation - Group assignments	1 x 150 menit	A, B, C, D
3	CPMK 3 CPMK 4	The definition and some examples of subgroup	Presentation, discussion	Make subgroup examples	Determine the subgroup of a given group	- Observation - Presentation - Individual assignments	1 x 150 menit	A, B, C, D
4	CPMK 3 CPMK 4	The properties of subgroup	Presentation and discussion	Know and prove the properties of the subgroup	Prove the properties of the subgroup	- Observation - Presentation - Individual assignments	1 x 150 menit	A, B, C, D

Perte-muan ke-	CPMK	Bahan Kajian Pembelajaran	Bentuk/Metode Pembela-jaran	Pengalaman Belajar	Indikator Penilaian	Teknik Penilaian	Waktu	Refe-rensi
5	CPMK 3 CPMK 4	Definition and examples of cyclic groups	Presentation and discussion	Make some examples of cyclic group	Give some examples of cyclic group	- Observation - Group assignments -	1 x 150 menit	A, B, C, D
6	CPMK 3 CPMK 4	The properties of cyclic group	Presentation and discussion	Know and prove the properties of a cyclic group, determine the generator	Prove the properties of a cyclic group and look for a generator	- Observation - Group assignments	1 x 150 menit	A, B, C, D
7	CPMK 3 CPMK 4	Definition of permutation groups, permutation group examples and properties of permutation group	Presentation and discussion	Determine permutation group elements and know the properties of permutation groups	Proving the properties of the permutation group	- Observation - Individual assignments	1 x 150 menit	A, B, C, D
8		Mid Test						
9	CPMK 3 CPMK 4	Coset and Lagrange Theorem	Discussion and Problem Solving	Determine all the cost of the given problem, determine the number of coset of a given subgroup	-List all of the coset of certain subgroup -prove the properties of coset	- Observation - Individual assignments -	1 x 150 menit	A, B, C, D
10	CPMK 3 CPMK 4	Normal subgroup	Discussion and Problem Solving	Make some examples of normal subgroup and prove the properties of a normal subgroup	Determine normal subgroup from given group	- Observation - Presentation - Individual assignments	1 x 150 menit	A, B, C, D

Perte-muan ke-	CPMK	Bahan Kajian Pembelajaran	Bentuk/Metode Pembela-jaran	Pengalaman Belajar	Indikator Penilaian	Teknik Penilaian	Waktu	Refe-rensi
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11	CPMK 3 CPMK 4	Group Factor	Discussion and Problem Solving	Determining the elements of the factor group, proves the characteristics of the factor group	-List all the factor group elements -Prove the properties of the factor group	quiz	1 x 150 menit	A, B, C, D
12	CPMK 3 CPMK 4	Group Homomorphism	Discussion and Problem Solving	Definition of homomorphism, examples of homomorphism	Construct the homomorphism of a given group	Group assignment	1 x 150 menit	A, B, C, D
13	CPMK 3 CPMK 4	The properties of homomorphism	Discussion and Problem Solving	Explore the properties of homomorphism	Solve the problem related to homomorphism	Observation, quiz	1 x 150 menit	A, B, C, D
14	CPMK 3 CPMK 4	Homomorphism on cyclic group	Discussion and Problem Solving	Explore the properties of homomorphism of cyclic groups	Solve the problem of homomorphism in cyclic group	Observation, quiz	1 x 150 menit	A, B, C, D
15	CPMK 3 CPMK 4	Fundamental Theorem of homomorphism	Discussion and Problem Solving	Prove and apply the fundamental homomorphism	Solve the problem related the fundamental homomorphism on	Group assignment	1 x 150 menit	A, B, C, D
16	CPMK 3 CPMK 4	Application of group in crytography	Ekspositori, diskusi	Introduction to cryp tography	Apply group in forming the key for encryption and description process	Observation, Presentation	1 x 150 menit	A, B, C, D

Referensi

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B. Malik, D.S., Mordeson, J.M., Sen, M.K.. 1997. Fundamentals of Abstract Algebra. Singapore: McGraw-Hill Companies, Inc.
C. Fraleigh, J.B.. 2006. A First Course in Abstract Algebra. Seventh Edition. New York: Addison-Wesley Publishing Company.
D. Herstein, I.N..1996. Abstract Algebra. Third Edition. Upper Saddle River: Prentice-Hall Int. Inc.
E. Stinson, D.R. 2006. Crptography, Theory And Practice. Third Edition. New York: Chapman and Hall/CRC.

Mengetahui   Yogyakarta, 30 Januari 2019
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