Kingdom of Saudi Arabia
Ministry of Higher Education
Majmaah University
Zulfi, College of Sciences
Mathematics Department

جامعة المجمعة
Majmaah University

المملكة العربية السعودية
وزارة التعليم العالي
جامعة المجمعة
كلية العلـــوم بالزلفي
قسم الرياضيات

COURSE CLASSIFICATION FORM

Course Number/Name	**Rings and Fields**		
Prepared by	**Dr. Rabah Kellil**		
Program Learning Outcomes	**Levels* (0,1,2, 3,4,5)**	**Relevant Activities**	**Assessment Methods/Metrics**
a1. Apply fundamentals and concepts of mathematics.	3		• Short exams • Quizzes • Discussion
a2. Apply fundamentals and concepts General sciences and	2		•
a3. Realize Social and ethical values	N.A		•
b1. Read and construct mathematical arguments and proofs.	3		• Short exams • Quizzes • Discussion
b2. Apply critical thinking skills to solve problems that can be modeled mathematically.	3		• Short exams • Quizzes • Discussion
c1. Work independently and within a team	2		Midterm exam+ Home works for
c2. Bear responsibility for different situations.	2	Report	• Home works for each thematic • Discussion
c3. Realize codes of ethics and their importance.	• NA		
d1. Communicate a depth and breadth of mathematical knowledge, both orally and in writing.	3	Report	• Home works for each thematic • Presentation
d2. Ability to Organize, connect and communicate mathematical concepts and or algorithmic	3		• Home works for each thematic • Presentation
d3. Critically interpret numerical and graphical data.	NA		•

e1. Use computer and its applications as an office tool	3	Roots of a polynomial, Euclidian division, factorization of a polynomial	• Lab work • Presentation

*** Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.**

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Course Objectives and Outcomes

Course Number: MATH444 Course Name: Rings and Fields
Prepared by: Dr. Rabah Kellil

Table 1: Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes:	PLO	NCAAA	Asiin
1- Definitions and examples of rings, fields, ideal, factor ring.	1- The student should be able to define , identify a ring structure. He also be able to identify its ideals and produce ideals generated by an element.	a	knowledge	a,b
	2-Rewirte the principal theorems related to rings fields and ideals. Be able to apply Factor ring theorem to construct new rings	c;d	Cognitive	f,j
	3-Discover the principal types of ideals(prime, maximal, principal)	e,f	Cognitive	
2- Normal subgroups, quotient (or factor) groups, cyclic groups,	1- Recall the order of an element, the order of a subgroup, construct subgroup generated by an element, recall the notion of cyclic group.	a,c	Knowledge +Cognitive	a,b,f,j
	2- Be able to prove that a subgroup is normal and then construct the corresponding factor group. apply Lagrange's theorem to have an idea on possible subgroups of a finite group and of the factor group	a, f	Knowledge +Cognitive	a,b,f,j;e
	3-Determine the nature of a subgroup of a cyclic group. Deduce the second form of Lagrange's theorem.	a,c	Knowledge +Cognitive	a,b,f,j

Course Objectives and Outcomes

3- homomorphism, Isomorphism's theorems, Automorphism, Symmetric groups S_n and properties, Cayley 's theorem and its generalization	1-The student should be able to recall and to use the principal isomorphisms theorems to compare two structures. To use those theorems to construct the subgroups of a factor group.	a,c	Knowledge +Cognitive	a,b,f,j,e
	2-the student should be able to perform with any permutation and can decompose it as a product of cycles and extract the properties of such permutation.	a,c	Knowledge +Cognitive	a,b,f,j,e
	3- the student should recognize the importance of Cayley's theorem to think that a finite group is subgroup of a certain group S_n and then can be easy to study.	a,c	Knowledge +Cognitive	a,b,f,j,e
4- Simple groups Group action on a set, Classes equation.	1-The student should be able to determine the principal facts related to the action of a group on a set.	c,d	Cognitive	f,j,e,h
	2-The student should be able to determine the different orbits of an action, to study the particular action of the group on itself and on the set of its subgroups.	c,d	Cognitive	f,j,e,h
	3-The student should be able to use the classes equation and its applications to study particular cases.	c,d	Cognitive	f,j,e,h
5-p-groups, Cauchy's theorem, Solow's theorems	1-The student should be able to apply the classes equation to study that a group of order p^2 is necessary abelain.	c,d	Cognitive	f,j,e,h
	2- The student should be able to apply the Cauchy's theorem and Sylow's theorem to classify finite groups.	c,d	Cognitive	f,j,e,h

Table 2: Methods of assessment of course syllabus

.

Assessment Method	Number/Type				Instructor Assessed	TA/Grader Assessed	Peer/Self Assessed
Homework	5 homework assignments				x		
Mid Terms/Final Exams	2 mid-term; 1 final exam				x		
Quizzes	One biweekly				x		
Individual Projects	1-2 wks	3-4 wks	1/2 sem	Full sem			

Course Objectives and Outcomes

Team Projects	1-2 wks x	3-4 wks	1/2 sem	Full sem	x		x
Lab Assignments							
Computer Assignments	One to two times a term				x		x
Computer Tools Used	Maple				x		
Oral Presentations	One				x		x
Written Reports	Usually				x		
Other					x		

جامعـــــــة المجمعـــــــــة
كليـــــة العلوم بالزلفي
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جامعة المجمعة
Majmaah University

Learning Outcomes Assessment : تقويم مخرجات التعلم
Second Semester - 1434-1435 H : الفصل الثاني - 1434-1435 هـ

Course Learning Outcomes

a	b	c	d	e
X	X	X	X	X

مخرجات التعلم للمقرر

Course Name	Rings and Fields	حلقات و حقول	اسم المقرر:
Course Code	MATH444		رمز المقرر :

نظري (3 ساعة) عملي (1 ساعة)

Students Achievement : تحصيل الطلاب

Total					Final Exam					ME2					ME1					H.W					Student إسم الطالب Name	رقم الطالب Student Nb	م No
a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e			
16	15	13	13	2	4	4	3	3	2	3	3	3	2		4	3	3	4		5	5	4	4		عبدالعزيز بن عواد بن صالح السالمي الحربي	28100151	1
16	15	14	12	1	4	4	4	3	1	4	4	4	3		3	3	2	2		5	4	4	4		احمد بن عماش بن محسن الفريدي الحربي	291107557	2
19	16	15	13	2	6	5	5	5	2	4	3	3	2		4	4	3	2		5	4	4	4		احمد بن عبدالعزيز بن عبدالرحمن الفالح	291107572	3
16	14	13	11	2	6	6	5	4	2	3	3	3	2		2	1	1	1		5	4	4	4		راكان بن موفق بن محمد مدني	292100597	4
17	15	14	13	2	6	5	5	5	2	4	3	3	2		3	3	2	2		4	4	4	4		أحمد بن عماش بن قينان الرخيمي المطيري	301106689	5
17	17	15	15	3	5	5	5	5	3	4	4	3	2		4	4	3	4		4	4	4	4		احمد بن محمد بن مبارك الضويفري المطيري	301110135	6
17	14	13	12	2	6	5	4	5	2	2	2	2	2		4	3	3	2		5	4	4	3		محمد بن عايد بن عيد الاحمدي	301110397	7
19	18	15	13	2	6	6	6	5	2	4	4	3	2		4	3	2	3		5	5	4	3		سلمان بن سالم بن سلمان الرشيدي	312100096	8
17	16	14	12	3	6	6	5	5	3	3	3	2	1,0		3	2	3	3		5	5	4	3,0		علي بن سليمان بن صالح الرشيدي	312100097	9
16	15	13	14	2	6	5	4	5	2	3	3	3	3,0		3	3	2	2		4	4	4	4,0		عبدالعزيز بن علي بن عبدالله الرشيد	431320169	10
18	18	15	14	3	6	6	5	5	3	3	3	3	3,0		4	4	3	3		5	5	4	3		سعود بن سعيد بن صالح الغامدي	431320349	11
17	16	14	13	2	5	5	5	4	2	4	3	3	3,0		3	3	2	3		5	5	4	3		فيصل بن جامع بن بن عزيز المطيرى	431320668	12
16	14	13	12	2	6	5	5	5	2	3	2	2	2,0		2	2	2	2		5	5	4	3		جابر بن احمد بن محمد خويري	431640019	13
15	15	13	11	2	4	4	4	4	2	4	4	3	3,0		2	2	2	1		5	5	4	3		عبدالكريم بن مهلم بن دليم الظفيري	431640201	14
13	13	11	7	2	6	6	6	3	2	4	4	3	2,0		3	3	2	2							عبد العزيز بن عبد الله بن عبد العزيز الماله	281103966	15
17	17	15	14	3	6	6	6	6	3	4	4	3	2,0		3	3	2	2		4	4	4	4,0		النشمي بن شعوي بن عسكر العوفي	292100481	16
																											17
																											13
																											14
																											14
																											15
																											15
																											16
																											16
																											17
17,1	15,5	14	12,75	2	5,38	5	4,625	4,375	2	3,5	3,25	3	2,125	0	3,5	3	2,375	2,5	0	4,75	4,25	4	3,75	0	Average المتوسط		
71%	65%	58%	53%	#	60%	56%	51%	49%	#	70%	65%	60%	43%	#	70%	60%	48%	50%	#	95%	85%	80%	75%	#	Percentage النسبة المئوية		

أستاذ المقرر: Dr. Rabah Kellil د.رابح عبد الرزاق كليل Course Teacher:

التوقيع: Signature:

رئيس القسم: أ.د. عادل محمد

التوقيع:

Majmaah University
Zulfi, College of Sciences
MATHEMATICS DEPARTMENT

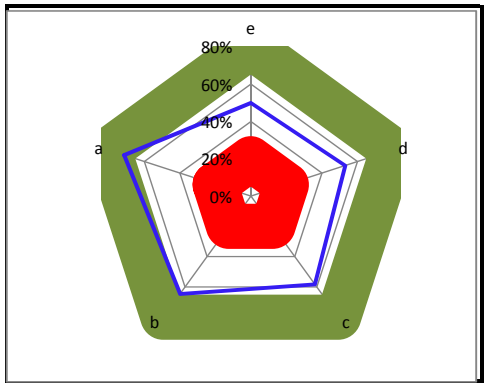
Section Number:	442	رقم الشعبة:
Students Number:	16	عدد الطلاب:

Lecture (3 Hours) Lab (1 Hours)

Assessment Tools Map مصفوفة أدوات القياس

	a	b	c	d	e	Total	T
H.W	5	5	5	5		20	57
ME1	5	5	5	5	0	20	57
ME2	5	5	5	5	0	20	63
LAB Ass	0	0	0			0	54
Final Exam T	9	9	9	9	4	40	59
							64
TOTAL	24	24	24	24	4	100	56
							65
							59

Assessment Results نتائج التقويم



57	63	54	59	64	56
65	59	58	65	60	55
54	44	63	0	0	0
0					

Head of Department: Prof. Dr. Adel M. Zaki زكي

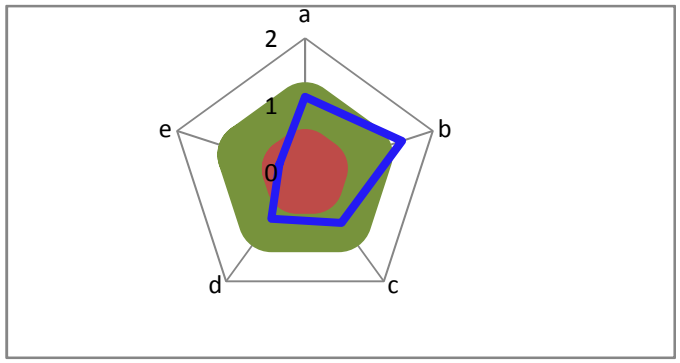
Signature:

a	b	c	d	e
71%	65%	58%	53%	50%

Students Outcomes Survey Analysis

Course Name	Rings and Fields	Course Code	MATH 444

	ID	Outcome A			Outcome B		Outcome C			Outcome d			Outcome E
		a1	a2	a3	b1	b2	c1	c2	c3	d1	d2	d3	e1
1	28100151	7	5	4	9	6	5	4	4	5	4	4	2
2	291107557	6	6	4	9	6	5	5	4	4	4	4	1
3	291107572	7	6	6	9	7	5	5	5	5	4	4	2
4	292100597	6	6	4	7	7	5	4	4	4	4	3	2
5	301106689	6	6	5	8	7	5	5	4	5	4	4	2
6	301110135	7	5	5	9	8	5	5	5	5	5	5	3
7	301110397	7	5	5	7	7	5	4	4	4	4	4	2
8	312100096	7	6	6	10	8	5	5	5	5	4	4	2
9	312100097	6	5	5	9	7	5	5	4	5	4	3	3
10	431320169	7	6	5	8	7	5	4	4	5	5	4	2
11	431320349	7	5	5	10	8	5	5	5	5	5	4	3
12	431320668	7	5	5	9	7	5	5	4	5	4	4	2
13	431640019	6	5	5	7	7	5	4	4	4	4	4	2
14	431640201	6	5	4	8	7	5	5	3	5	4	2	2
15	281103966	5	4	4	7	6	4	4	3	3	2	2	2
16	292100481	7	6	4	9	8	5	5	5	5	5	4	3
		6,57	5,57	4,71	8,29	6,86	5,00	4,57	4,29	4,57	4,14	4,00	2,00
		131%	111%	94%	166%	137%	100%	91%	86%	91%	83%	80%	40%
		112%			151%		92%			85%			40%



a	b	c	d	e

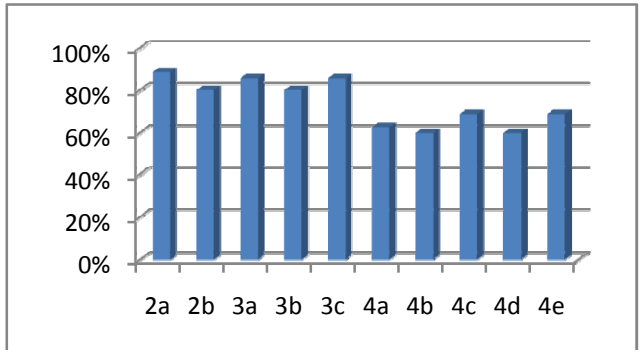
Catalog description	Text Book Evaluations	Computer Usage Evaluations

2a	2b
5	5
5	4
5	4
4	4
4	3
4	4
4	4
5	5
5	4
5	4
4	4
4	3
4	4
4	4
4	4
4	4
4,43	4,00
89%	80%
84%	

3a	3b	3c
5	5	5
3	4	4
5	5	5
5	4	5
5	4	5
4	3	3
3	3	3
5	5	5
3	4	4
5	5	5
5	4	5
5	4	5
4	3	3
3	3	3
5	5	5
3	4	4
4,29	4,00	4,29
86%	80%	86%
84%		

4a	4b	4c	4d	4e
5	5	5	5	5
3	4	5	3	5
5	4	4	4	5
1	1	1	2	2
2	2	2	2	1
2	2	2	2	2
4	3	5	3	4
5	4	4	4	5
1	1	1	2	2
2	2	2	2	1
2	2	2	2	2
4	3	5	3	4
2	2	2	2	2
4	3	5	3	4
5	4	4	4	5
1	1	1	2	2
3,14	3,00	3,43	3,00	3,43
63%	60%	69%	60%	69%

2a	2b	3a	3b	3c	4a	4b	4c	4d	4e		
89%	80%	86%	80%	86%	63%	60%	69%	60%	69%		



112%	151%	92%	85%	40%

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Instructor Course Evaluation Form

The purpose of this evaluation is to collect instructor feedback for improving this course and the Mathematics program. Information will also be used for program accreditation purposes.

I. Program Learning Outcomes Evaluations

Course Number/Name	MATH444 Rings and Fields	Semester	First 1434/1435
Instructor	Dr. Rabah Kellil	Spring	

The course listed above is designed for students to achieve the following outcomes at a Not At All, Low, Low- Medium, Medium, Medium-High or High level.

Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.

Program Learning Outcomes	Relevant Activities	5	4	3	2	1	0
a1. Apply fundamentals and concepts of mathematics.	Lectures, Assignments,			3			
a2. Apply fundamentals and concepts General sciences and Computer skills.	Assignments on creativity dealing with physical systems				2		
a3. Realize Social and ethical values.	Design project; Lectures and assignments						
b1. Read and construct mathematical arguments and proofs.	Design project;			3			
b2. Apply critical thinking skills to solve problems that can be modeled mathematically.	Lectures and assignments.			3			
c1. Work independently and within a team	Design project Home works			3			
c2. Bear responsibility for different situations.	Design project in which students demonstrate basic knowledge of Mathematics in the development of the			3			
c3. Realize codes of ethics and their importance.	Design project; Lectures						
d1. Communicate a depth and breadth of mathematical knowledge, both orally and in writing.	Design project in which students show ability to apply principles of Mathematical and Statistical data			3			
d2. Ability to Organize, connect and communicate mathematical and algorithmic ideas.	Design project; Lectures and assignments			3			
d3. Critically interpret numerical and graphical data.	Design project; Lectures and assignments			3			
e1. Use computer and its applications as an office tool	Lectures and oral discussions on identification of the project goals and constraints				2		

II. Catalog Description , and Course Prerequisites Evaluations:

Based on your experiences in the course, please respond by circling the most appropriate number. Circle N/A for items that are not applicable, or if you have no opinion.

Catalog Description 1434-1435	• **I-Preliminary definitions ,rings, subrings, fields, Group of units, zero divisors integral domain, nilpotent and idempotent elements** • **II-Ideals and factor rings, Principal ring.** • **III-Prime and maximal ideals- Field of quotient of integral domain- Characteristic of a ring.** • **IV-Direct sum of rings- Modules- Euclidean rings .** • **V-Ring of Polynomials- Roots of polynomials over a field.** • **VI-Fields extensions- Finite and simple extensions of fields** • **VII-Algebraic closure of a field- Splitting fields.** • **VIII-Finite fields and application**.						
Course Prerequisites:	MATH243 Group Theory	**Circle One (5=Strongly Agree; 1=Strongly disagree)**					
2a. Do you believe that the catalog description (above) is accurate for this course?		(5)					
2b. Do you believe that the course prerequisites (above) are appropriate for this course?			4				
2c. If not, please list any prerequisites you believe are not appropriate for this course.							

III. Textbook(s) and/or Lab Manuals (if applicable) Evaluations:

Textbook(s) and/or Lab Manuals (if applicable):	- J.B. Farieigh : A first Course in Abstract Algebra. ; Addison – Wesley ;1989 . - P. Hartley and T. O. Hawkes : Rings , Modules and Linear Algebra . London , New York ; Chapman and Hall . 1991 . - T. W. Hungerford : Algebra , New York ; Springer – Verlag ; 1984 . - S. Lang : Algebra . Reading , Massachusetts ; Addison – Wesley; 1984 - R. Lidl and H. Niederreiter : Introduction to Finite Fields and Their Applications. Revised edition, Cambridge University Press ; 1994 . - H. Matsumura : Commutative Rings Theory . Cambridge University Press, Cambridge; 1992.	*4* *4* *3* *4* *3* *5*
3a. In general, do you believe this to be an appropriate textbook for this course?		5
3b. Was the organization of the textbook appropriate for this course?		4
3c. Was the level of the textbook appropriate for this course?		4

IV. Computer usage (if applicable) Evaluations:

Computer usage (if applicable):		Circle One (5=Strongly Agree; 1=Strongly Disagree)					
5a. Was the use of computer well integrated with the course?		(5)					
5b. Was the computer lab adequately equipped with well-maintained and updated computers?				(3)			
5c. Was the computer lab equipped with sufficient number of computers?			(4)				
5d. Were the special software packages (MATLAB, SPSS, C+, FORTRAN, etc) available and accessible?					(2)		
5e. Was adequate technical support available when needed?			(4)				

V. **Computer usage (if applicable) Evaluations:**

Computer usage (if applicable):		Circle One (5=Strongly Agree; 1=Strongly Disagree)					
5a. Was the use of computer well integrated with the course?		5					
5b. Was the computer lab adequately equipped with well-maintained and updated computers?					2		
5c. Was the computer lab equipped with sufficient number of computers?				3			
5d. Were the special software packages (MATLAB, SPSS, C+, FORTRAN, etc) available and accessible?						1	
5e. Was adequate technical support available when needed?				3			

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Student Course Evaluation Form

The purpose of this evaluation is to collect instructor feedback for improving this course. Information will also be used for program accreditation purposes.

I. **Program Learning Outcomes Evaluations**

Course Number/Name	MATH444 Rings and Fields	Semester	First 1434/1435
Instructor	Dr. Rabah Kellil	Spring	

The course listed above is designed for students to achieve the following outcomes at a Not At All, Low, Low- Medium, Medium, Medium-High or High level.

Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.

Program Learning Outcomes	5	4	3	2	1	0
a1. Ability to apply Fundamentals of different branches of pure and applied mathematics.				2		
a2. Ability to apply General sciences .						N.A
a3. Ability to apply Computer skills.				2		
a4. Ability to apply Social and ethical values.						N.A
a5. Ability to use English Language as a second language.					1	
b1. Ability to Reasonable and creative thinking, relating introductions to results and problem solving.				2		
b2. Ability to Formulate or idealize the identified problem as a mathematical model.			3			
b3. Ability to Solve the formulated problem by applying the technical skills gained in various classes.				2		
b4. Ability to Analyze and interpret experimental data.						N.A
c1. Ability to work individually or within a team.			3			
c2. Ability to Learn the initiative spirit and bear responsibility for different situations.				2		
c3. Ability to Understand the importance of professional responsibility regarding product liability.			3			
c4. Ability to Understand codes of ethics and their importance.						N.A
d1. Ability to Extract high benefits from the use of the World Wide Web,			3			
d2. Ability to Use mathematical software such as Matlap and Mathematica and getting			3			
d3. Ability to Organize, connect, and communicate mathematical and algorithmic			3			
d4. Ability to Acquire facility with several significant technological tools, and use them effectively for computation, exploration, and presentation.			3			
e1. Ability to Select appropriate analytic and design tools for Mathematical problems.			3			
e2. Ability to Use technological application software as analysis and application tools..			3			

II. Catalog Description , and Course Prerequisites Evaluations:

Based on your experiences in the course, please respond by circling the most appropriate number. Circle N/A for items that are not applicable, or if you have no opinion.

Catalog Description 1434-1435	• **I-Preliminary definitions ,rings ,subrings, fields, Group of units, zero divisors integral domain, nilpotent and idempotent elements** • **II-Ideals and factor rings, Principal ring.** • **III-Prime and maximal ideals- Field of quotient of integral domain- Characteristic of a ring.** • **IV-Direct sum of rings- Modules- Euclidean rings .** • **V-Ring of Polynomials- Roots of polynomials over a field.** • **VI-Fields extensions- Finite and simple extensions of fields** • **VII-Algebraic closure of a field- Splitting fields.** • **VIII-Finite fields and application**.						
Course Prerequisites:		**Circle One (5=Strongly Agree; 1=Strongly disagree)**					
2a. Do you believe that the catalog description (above) is accurate for this course?		(5)					
2b. Do you believe that the course prerequisites (above) are appropriate for this course?			4				
2c. If not, please list any prerequisites you believe are not appropriate for this course.							

III. Textbook(s) and/or Lab Manuals (if applicable) Evaluations:

Textbook(s) and/or Lab Manuals (if applicable):	- J.B. Farieigh : A first Course in Abstract Algebra. ; Addison – Wesley ;1989 .	*4*
	- P. Hartley and T. O. Hawkes : Rings , Modules and Linear Algebra . London , New York ; Chapman and Hall . 1991 .	*4*
	- T. W. Hungerford : Algebra , New York ; Springer – Verlag ; 1984 .	*3*
	- S. Lang : Algebra . Reading , Massachusetts ; Addison – Wesley; 1984	*4*
	- R. Lidl and H. Niederreiter : Introduction to Finite Fields and Their Applications. Revised edition, Cambridge University Press ; 1994 .	*3*
	- H. Matsumura : Commutative Rings Theory . Cambridge University Press, Cambridge; 1992.	*5*
3a. In general, do you believe this to be an appropriate textbook for this course?		5
3b. Was the organization of the textbook appropriate for this course?		4
3c. Was the level of the textbook appropriate for this course?		4

IV. Computer usage (if applicable) Evaluations:

Computer usage (if applicable):		Circle One (5=Strongly Agree; 1=Strongly Disagree)					
5a. Was the use of computer well integrated with the course?		(5)					
5b. Was the computer lab adequately equipped with well-maintained and updated computers?				(3)			
5c. Was the computer lab equipped with sufficient number of computers?			(4)				
5d. Were the special software packages (MATLAB, SPSS, C+, FORTRAN, etc) available and accessible?					(2)		
5e. Was adequate technical support available when needed?			(4)				