Course Specification

(Postgraduate)

Course Title: **Galois Theory**
Course Code: **MATH644**
Program: **Master Program in Mathematics**
Department: **Mathematics**
College: **Science**
Institution: **University of Tabuk, KSA**
Version: **2**
Last Revision Date:**1/12/1443 H**

Table of Contents

A. General information about the course:

Course Identification					
1. Credit hours:	3 H				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☐	Elective☒			
3. Level/year at which this course is offered: Level-2 or higher					
4. Course general Description In this course, we will study some basic fundamentals of Galois Theory. Some important properties, theorems, problems, and applications will be also discussed.					
5. Pre-requirements for this course (if any): None					
6. Co- requirements for this course (if any): None					

7. Course Main Objective(s)

1. Identify and recall the basic concepts on field to develop the interest of the concerned subject.
2. Describe the Basic definitions and Theorems on field.
3. How to calculate a field extension and algebraic extension.
4. Discuss the concept of splitting field by using this definition to learn the related concepts.
5. Introduce the concepts of separable extensions.
6. Explain the basic definitions and Theorems on automorphism and group of automorphisms of a field.
7. Introduce the notion of Galois group and study Galois group of a separable polynomial.
8. Study the Galois field and the fundamental theorems of Galois Theory.

1. Teaching mode(mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	45	100 %
2.	E-learning		
3.	Hybrid ● Traditional classroom ● E-learning		
4.	Distance learning		

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	3 H /week
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding The students will be able to:			
1.1	Demonstrate various concepts of Galois group and related topics.	K1	Lectures, Group works, Presentations, Classroom discussion, Seminar, Case study, problem solving session.	Exams, Quizzes, Research project, presentation, interactive discussion and participation, Survey
1.2	Enhance an advanced understanding of the definitions, relations, and application of Galois Theory.	K3		
2.0	Skills The students will be able to:			
2.1	Apply the daily life applications of Galois field.	S1	Lectures, Group works, Presentations, Classroom discussion, Seminar, Case study, problem solving session	Research project, Home works, Assignments, presentation, interactive discussion and participation, Surveys.
2.2	Analyze the results in practical examples.	S2		
2.3	Using advanced mathematical concepts effectively through mathematical problems.	S3		
3.0	Values, autonomy, and responsibility The students will be able to:			
3.1	Perform academic integrity and	V1	Lectures, Group works,	Research

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	professional ethics when dealing with academic issues.		Presentations, Classroom discussion, Seminar, Case study, problem solving session	project, Home works, Assignments, presentation, interactive discussion and participation, Surveys.
3.2	Demonstrate and managing their time and duties with friends and with groups	V2		

C. Course Content

No	List of Topics	Contact Hours
1	Basic definitions, theorems and examples on field	3
2	Field extension and examples,	3
3	Algebraic extension and examples and Theorems	3
4	Splitting field	3
5	Related concepts	3
6	Separable extensions	3
7	Theorems on automorphism	3
7	**Mid-Exam**	
8	Group of automorphisms of a field	3
9	Group of automorphisms of a field	3
10	Galois group and related theorems	3
11	Galois group and related theorems	3
11	Galois group of a separable polynomial	3
12	Galois group of a separable polynomial	3
13	Galois field and related Theorems	3
14	Fundamental theorems of Galois Theory	3
15	Fundamental theorems of Galois Theory	3
16+17	**Revision & Final Exam**	
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Home works and Assignments	Weekly basis	20%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Mid-term exam	7th weeks	25%
3.	Presentation and discussion	During the Semester	15%
4.	Final Exam	At End of Semester	40 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. Galois Theory, 4th Edition, Ian Nicholas Stewart, 2015, Chapman and Hall/CRC. 2. The Separable Galois Theory of Commutative Rings, 2nd Edition, Andy R. Magid, 2014, Chapman and Hall/CRC.
Supportive References	
Electronic Materials	Saudi Digital Library
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Room with capacity of 30 students and equipped with White Board, Library
Technology equipment (projector, smart board, software)	Overhead projector and internet connection.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Direct and Indirect
Effectiveness of students assessment	Teacher	Direct
Quality of learning resources	Students	Indirect
The extent to which CLOs have been achieved	Teacher, Quality Committee	Direct and Indirect
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods(Direct, Indirect)

G. Specification Approval Data

Council / Committee	**Approval by the Department Council**
Reference No.	DEPARTMENT COUNCIL NO (26)
Date	**11/9/1444 H**