T-104
2022

# Course Specification

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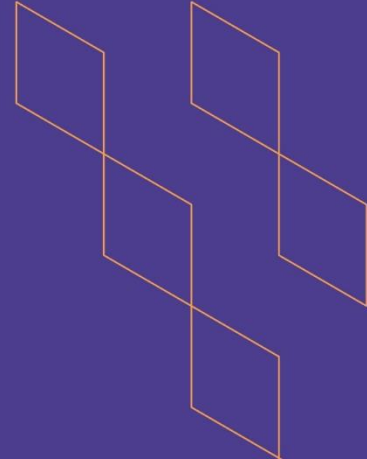
| Course Title: | **Abstract Algebra (1)** |
|---|---|
| Course Code: | **364Math-3** |
| Program: | **B.Sc. of Mathematics** |
| Department: | **Mathematics** |
| College: | **Arts and Sciences** |
| Institution: | **Najran University** |
| Version: | **1** |
| Last Revision Date: | **07-05-2023** |

# Table of Contents:

# A. General information about the course:

| Course Identification | | | | |
|---|---|---|---|---|
| 1. Credit hours: | 3 | | | |
| 2. Course type | | | | |
| a. | University ☐ | College ☐ | Department ☒ | Track☐ Others☐ |
| b. | Required ☒ | Elective☐ | | |
| 3. Level/year at which this course is offered: | | 5/3 | | |
| 4. Course general Description | | | | |

This course will cover the foundations of groups theory. The focus of this course is on Basic concepts and properties of groups, Homomorphism of groups, Normal subgroups, and quotient groups.

| | |
|---|---|
| 5. Pre-requirements for this course (if any): | |
| 6. Co- requirements for this course (if any): | |
| 7. Course Main Objective(s): | |

This course aims to give the student the basic concepts and properties of Group theory.

## 1. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1. | Traditional classroom | 3 | 100 |
| 2. | E-learning | | |
| 3. | Hybrid <br> • Traditional classroom <br> • E-learning | | |
| 4. | Distance learning | | |

## 2. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1. | Lectures | 45 |
| 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 | | | |
| 1.1 | Define the basis terminology of rings theory. | K1 | • Lecture<br>• Cooperative learning<br>• Problem solving | • Assignments<br>• Quizzes<br>• Midterm<br>• Final Exam |
| 1.2 | State famous elementary results of rings theory. | | | |
| 2.0 | Skills | | | |
| 2.1 | Solve some problems using properties of rings | S1 | • Lecture<br>• Cooperative learning<br>• Problem solving | • Assignments<br>• Quizzes<br>• Midterm<br>• Final Exam |
| 2.2 | Distinguish the types of rings using rings isomorphism theorems | S2 | | |
| ...2.3 | Prove elementary theorems related to rings theory | S4 | | |
| 3.0 | Values, autonomy, and responsibility | | | |
| 3.1 | Work as part of a team and independently | V1 | Homework and discussions in the classes | Oral Exam<br>Rubrics |

## C. Course Content

| No | List of Topics | Contact Hours |
|----|----------------|---------------|
| 1. | Definitions, examples, and basic properties of groups | 6 |
| 2. | Permutations groups, symmetry groups. | 3 |
| 3 | Subgroups, and basic properties | 6 |
| 4 | Generators and cyclic groups and cyclic subgroups | 9 |
| 5 | Homeomorphisms of groups | 6 |
| 6 | Cossets and Lagrange's theorem | 3 |
| 7 | Normal subgroups and quotient groups. | 9 |
| 8 | Roots of polynomials rings over a field | 3 |
| | Total | 45 |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | Midterm Exam 1 | 6-8 | 20 |
| 2. | Assignments & Quizzes | During classes | 10 |
| 3. | Midterm Exam 2 | 13-15 | 20 |
| 4. | Final Exam | 16-17 | 50 |

*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 | فالح عمران الدوسري المدخل إلى نظرية الزمر ,, الطبعة الثانية 1422هـ مكتبة الملك فهد الوطنية |
|---|---|
| Supportive References | John B. Fraleigh, A frist Course in Abstract algebra, fourth edition. New York 1989 |
| Electronic Materials | - W. K. Nicholson, Introduction to Abstract Algebra, PWS-Kent Publishing. Boston 1993 |
| Other Learning Materials | |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Classroom with 30 seats. |
| Technology equipment (projector, smart board, software) | - Blackboard Platform<br>- Projector |
| Other equipment (depending on the nature of the specialty) | **N/A** |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Student | Student Questionnaire (Indirect) |
| Effectiveness of students assessment | Peer Reviewer | Rubrics (Indirect) |
| Quality of learning resources | | |

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| The extent to which CLOs have been achieved | Faculty | Direct |
| Other | | |

## G. Specification Approval Data

| COUNCIL /COMMITTEE | Council of Mathematics Department |
|---|---|
| REFERENCE NO. | 14441017-0208-00014 |
| DATE | 17-10-1444H |