# Course Specifications

| | |
|---|---|
| **Course Title:** | General Mathematics |
| **Course Code:** | 1003-101 |
| **Program:** | N/A |
| **Department:** | Basic Science |
| **College:** | Deanship of Preparatory Year & Supportive Studies |
| **Institution:** | Northern Border University |

## Table of Contents

## A. Course Identification

| |
|---|
| **1. Credit hours: 3** |
| **2. Course type**<br>**a.** University [√] College [ ] Department [ ] Others [ ]<br>**b.** Required [√] Elective [ ] |
| **3. Level/year at which this course is offered:**<br>**Preparatory Year** |
| **4. Pre-requisites for this course** (if any)**:**<br>**N/A** |
| **5. Co-requisites for this course** (if any)**:**<br>**N/A** |

**6. Mode of Instruction** (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | **Traditional classroom** | 3 | 100% |
| 2 | **Blended** | - | - |
| 3 | **E-learning** | - | - |
| 4 | **Correspondence** | - | - |
| 5 | **Other** | - | - |

**7. Actual Learning Hours** (based on academic semester)

| No | Activity | Learning Hours |
|---|---|---|
| **Contact Hours** | | |
| 1 | **Lectures** | 45 |
| 2 | **Laboratory/Studio** | - |
| 3 | **Tutorial** | - |
| 4 | **Others** (specify) | - |
| | **Total** | 45 |
| **Other Learning Hours*** | | |
| 1 | **Study** | 45 |
| 2 | **Assignments** | 25 |
| 3 | **Library** | 25 |
| 4 | **Projects/Research Essays/Theses** | 10 |
| 5 | **Others** (Homework) | - |
| | **Total** | 105 |

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

**1. Course Description**

**Fundamentals:** Real numbers - Sets of Numbers - Real Line - Interval Notation - Absolute Value - Exponents and Radicals - Algebraic Expressions – Fractional expressions.

**Equations, Inequalities and Line:** Solving equations and Inequalities - Coordinate Plane – Distance and Midpoint Formulas – Equation of Line.

**Function and Their Graphs:** Function Notation – Vertical Line Exam – Domain and Range - Graphs of Functions – Even and Odd Functions – Rational Functions - Function Arithmetic – Function Composition - One – to – one functions and their inverses.

**Polynomial Functions:** Polynomial and Rational functions Polynomial functions and their graphs - dividing polynomials.

**Exponential and Logarithmic functions**: Exponential and Logarithmic equations – Graphs of Exponential and Logarithmic function – Solving Exponential and Logarithmic Equations.

**The Radian Measure and Unit Circle:** Radian Measure – The Unit Circle - Trigonometric Functions – The six Circular Function – Trigonometric Identities – Graphs of The Trigonometric Functions.

### 2. Course Main Objective

1- Learn basic math rules and laws.
2- Use rules and laws to resolve various examples.
3- Understand the key concepts.
4- Students gain logical thinking skills needed to resolve issues.

### 3. Course Learning Outcomes

| | CLOs | Aligned PLOs |
|---|---|---|
| 1 | **Knowledge:** | |
| 1.1 | Recognize real numbers and their operations. | N/A |
| 1.2 | Differentiate between types of equations and inequalities and methods to solve them. | N/A |
| 2 | **Skills:** | |
| 2.1 | Apply the simplifying of algebraic expressions. | N/A |
| 2.2 | Solve different equations and inequalities and their applications. | N/A |
| 2.3 | Use mathematics learning resources to deduce the conceptions and laws to solve problems. | N/A |
| 3 | **Competence:** | |
| 3.1 | Participate effectively with other colleagues in solving a problem as a team member. | N/A |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1 | Fundamentals | 9 |

| | | |
|---|---|---|
| 2 | Equations, Inequalities and Line | 9 |
| 3 | Function and Their Graphs | 9 |
| 4 | Polynomial Functions | 6 |
| 5 | Exponential and Logarithmic functions | 6 |
| 6 | The Radian Measure and Unit Circle | 6 |
| **Total** | | 45 |

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Teaching Strategies | Assessment Methods |
|---|---|---|---|
| **1.0** | **Knowledge** | | |
| 1.1 | Recognize real numbers and their operations. | Lectures. | Quizzes, Mid-term Exam, Final Exam. |
| 1.2 | Differentiate between types of equations and inequalities and methods to solve them. | Self-learning<br>Debate and discussion | Reviewing and correcting errors |
| **2.0** | **Skills** | | |
| 2.1 | Apply the simplifying of algebraic expressions. | Lectures. | Activities. |
| 2.2 | Solve different equations and inequalities and their applications. | Debate and discussion | Quizzes, Mid-term Exam, Final Exam |
| 2.3 | Use mathematics learning resources to deduce the conceptions and laws to solve problems. | Cooperative learning | Activities. |
| **3.0** | **Competence:** | | |
| 3.1 | Participate effectively with other colleagues in solving a problem as a team member. | Group Discussions and exchange information and experiences | Activities. |

### 2. Assessment Tasks for Students

| # | Assessment task* | Week Due | Percentage of Total Assessment Score |
|---|---|---|---|
| **1** | Assessments | Every Week | 10% |
| **2** | Activities. | Every Week | 5% |
| **3** | Quizzes | 6-10-14 | 15% |
| **4** | Mid – Term Exam | 8 | 30% |
| **5** | Final Exam | 16 | 40% |

***Assessment task** (i.e., written Exam, oral Exam, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

Student counseling and academic Committee works through the faculty a cultural, social and sports activities for students

## F. Learning Resources and Facilities

### 1.Learning Resources

| | |
|---|---|
| **Required Textbooks** | Precalculus for Preparatory Year Students |
| **Essential References Materials** | 1- Wu, H.-H. (2020) *Pre-Calculus, Calculus, and Beyond*, American Mathematical Society. ISBN-13: 978-1470456771<br>2- Stewart, J. (2015). Calculus Early Transcendental, 8th edition, Brooks/Cole. ISBN-13: 978-1285741550<br>3- Stewart, J., Redlin, L., Watson, S. (2015). *Precalculus Mathematics for Calculus, International Metric Edition (7th edition)*, Cengage Learning Custom Publishing. |
| **Electronic Materials** | Blackboard system |
| **Other Learning Materials** | 1- Web sites of the other Saudi Universities,<br>2- Learning videos on YouTube.<br>3- Self-learning. |

### 2. Facilities Required

| Item | Resources |
|---|---|
| **Accommodation** | Classrooms |
| **Technology Resources** | Data show, Smart Board |
| **Other Resources** | - |

## G. Course Quality Evaluation

| Evaluation Areas/Issues | Evaluators | Evaluation Methods |
|---|---|---|
| Strategies for getting feedback from students about teaching quality | Students | Indirect, Direct |
| Other strategies for evaluating the teaching process | Teacher | Direct |
| Teaching development | Department & College | Indirect, Direct |
| Verification of teaching standards | Independent Teacher | Indirect, Direct |
| Action plan for development | Department | Indirect |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

| | |
|---|---|
| **Council / Committee** | Basic Sciences Department - Dean of Preparatory Year & Supportive Studies |

| | |
|---|---|
| **Reference No.** | 2nd |
| **Date** | 23-07-1443 H |