2023
TP-153

# Course Specification
(Bachelor)

| | |
|---|---|
| **Course Title:** | Introduction to Mathematics |
| **Course Code:** | Math1101 |
| **Program:** | General course |
| **Department:** | Mathematics |
| **College:** | Faculty of Science |
| **Institution:** | University of Tabuk |
| **Version:** | 4 |
| **Last Revision Date:** | 10 September 2023 |

## Table of Contents

## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: | | | | | |
|---|---|---|---|---|---|
| 3 Credit hours ( 3 h Theoretical ) | | | | | |
| **2. Course type** | | | | | |
| A. | ☒ University | ☐College | ☐Department | ☐Track | ☐Others |
| B. | ☒ Required | | ☐Elective | | |
| **3. Level/year at which this course is offered: ( Level 1 / Year 1)** | | | | | |
| **4. Course general Description:** | | | | | |
| The course will focus on elementary concepts of mathematics before a student undertakes advanced study in mathematics. Topics include algebra of the real numbers, algebraic, absolute value in equations and inequalities, complex numbers and elementary functions with an emphasis on their graphical properties and algebraic manipulations. Particular functions treated include linear, quadratic, polynomial, rational, exponential, logarithmic functions and trigonometric functions.<br>The students will also have an idea on right triangles, trigonometric identities, sequences, mathematical Induction, binomial formula and elementary geometry, such as circles and triangles. | | | | | |
| **5. Pre-requirements for this course (if any):** | | | | | |
| NA | | | | | |
| **6. Co-requisites for this course (if any):** | | | | | |
| NA | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| The main goal of this course is to familiarize the students with the graphs, properties, and algebraic manipulations of elementary functions. They will be also able to use the basic concepts of mathematics, especially the basic algebraic operations, trigonometry, complex numbers sequences, mathematical induction and binomial formula and recognize the coordinates systems and their use in simple geometric cases. | | | | | |

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

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | 45 | 100% |
| 2 | E-learning | | |
| 3 | Hybrid<br>• Traditional classroom<br>• E-learning | | |
| 4 | Distance learning | | |

## 3. 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 | Recall the definition of absolute value, elementary functions such as quadratic, trigonometric, exponential, logarithmic and their graphs. | ILO1 | Lectures<br>Class Discussions | Quizzes<br>Midterm Exam<br>Final Exam |
| 1.2 | Recognize the role of some concepts such as complex numbers | ILO1 | Lectures<br>Class Discussions | Quizzes<br>Midterm Exam<br>Final Exam |
| ... | | | | |
| **2.0** | **Skills** | | | |
| 2.1 | Apply the basic algebra skills to solve mathematical problems. | ILO1 | Lectures<br>Class Discussions<br>Cooperative learning Assign tasks | Quizzes<br>Midterm Exam<br>Final Exam<br>Homeworks |
| 2.2 | Solve linear equations and inequalities including absolute value, quadratic, radical, exponential and logarithmic functions | ILO1 | Lectures<br>Class Discussions<br>Cooperative learning Assign tasks | Quizzes<br>Midterm Exam<br>Final Exam<br>Homework's |

| Code | Course Learning Outcomes | Code of CLOs aligned with program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| 2.3 | Manipulate the elementary rules in triangles, and circles, and thus deduce the trigonometric identities easily | ILO1 | Lectures<br>Class Discussions<br>Cooperative learning Assign tasks | Quizzes<br>Midterm Exam<br>Final Exam<br>Homework's |
| 2.4 | Prove simple statements using mathematical induction | ILO1 | Lectures<br>Class Discussions<br>Cooperative learning Assign tasks | Quizzes<br>Midterm Exam<br>Final Exam<br>Homework's |
| 2.5 | Apply the knowledge of sequences in a variety of contexts | ILO1 | Lectures<br>Class Discussions<br>Cooperative learning Assign tasks | Quizzes<br>Midterm Exam<br>Final Exam<br>Homework's |
| **3.0** | **Values, autonomy, and responsibility** | | | |
| 3.1 | Take responsibility to work independently and with other members of the group | ILO8- ILO10 | Cooperative learning Assign tasks | Homework's<br>Class participation<br>Essay |
| 3.2 | Demonstrate time management in self-study. | ILO9 | Cooperative learning Assign tasks | Homework's<br>Class participation<br>Essay |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| **1.** | Basic Algebraic Operations. | 3 hrs |
| **2.** | Absolute Value in Equations and Inequalities. | 3 hrs |
| **3.** | Complex Numbers. | 3 hrs |
| **4.** | Distance in the Plane, Functions | 3 hrs |
| **5.** | Graphing Functions, Even and Odd Functions. | 3 hrs |
| **6.** | Quadratic Functions. | 3 hrs |
| **7.** | Operations on Functions. | 3 hrs |
| **8.** | Inverse Functions. | 3 hrs |
| **9.** | Exponential and Logarithmic Functions. | 3 hrs |
| **10.** | Trigonometric Function Properties and Identities. | 3 hrs |
| **11.** | Right Triangles. | 3 hrs |

| | | |
|---|---|---|
| 12. | Sequences. | 3 hrs |
| 13. | Mathematical Induction. | 3 hrs |
| 14. | Arithmetic and Geometric Sequences. | 3 hrs |
| 15. | Binomial Formula. | 3 hrs |
| **Total** | | **45** hrs |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | Activities | Weekly basis | 5% |
| 2. | Homework | Weekly basis | 5% |
| 3. | Quizzes | Weekly basis | 10% |
| 4. | Mid Exam1 | 6th week | 20% |
| 5. | Mid Exam2 | 11th week | 20% |
| 6. | Final Exam | At end of the 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** | Precalculus: A custom publication by McGraw Hill, By Barnett, Ziegler, Byleen, Sobecki, 2011. |
| **Supportive References** | 1.Courant, Richard, and Fritz John. Introduction to calculus and analysis I. Springer Science & Business Media, 2012<br>2.Elements of Mathematical Logic and Set Theory Hardcover – Import, January 1, 1967, by L. Slupecki, J.; Borkowski (Author) |
| **Electronic Materials** | Saudi electronic library<br>https://www.sdl.edu.sa/ |
| **Other Learning Materials** | All materials requested by the staff members during the lectures |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities**<br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Lecture Room with maximum capacity of 30 students and equipped with White Board |
| **Technology equipment**<br>(projector, smart board, software) | Data show, Smart board and internet connection. |
| **Other equipment**<br>(depending on the nature of the specialty) | -- |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | Students | Direct/Indirect |
| | Department/Faculty | Direct/Indirect |
| | External committees | Indirect |
| Effectiveness of Students assessment | Students | Direct/Indirect |
| | Department/Faculty | Direct/Indirect |
| | External committees | Indirect |
| Quality of learning resources | Students | Direct/Indirect |
| | Department/Faculty | Direct/Indirect |
| | External committees | Indirect |
| The extent to which CLOs have been achieved | Students | Direct/Indirect |
| | Department/Faculty | Direct/Indirect |
| | External committees | Indirect |
| Other | | |

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

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|---|---|
| **COUNCIL /COMMITTEE** | **Approval by the Department Council** |
| **REFERENCE NO.** | DEPARTMENT COUNCIL NO (7) |
| **DATE** | **14/09/2023** |