# USiU

## UNITED STATES INTERNATIONAL UNIVERSITY

**SEMESTER:**
**MTH 1105A: ALGEBRA IN PRACTICAL CONTEXT**
**COURSE OUTLINE**
**DAY/TIME:**
**INSTRUCTOR:**
**CREDIT: 3 UNITS**
**CONSULTATION HOURS:**
**COURSE MISSION**
This course is aimed at upgrading students' performance in mathematics, through a study of various topics in the introductory modern algebra including properties of real numbers, linear equations, and inequalities; polynomials, rational expressions, exponential and roots, quadratic equations, systems of linear equations; application of algebra to everyday problems.

**COURSE LEARNING OUTCOMES**
By the end of the course each of the students should be able to,
  a. Collect, analyze, and evaluate data or information to formulate conclusions.
  b. Demonstrate the ability to reason critically, logically and creatively in an algebraic context.
  c. Demonstrate competence in oral and written algebraic related communication.
  d. Apply basic scientific, quantitative and technological (IT) skills in a changing environment.

**CONTENT AND LEARNING OUTCOMES ALLIGNMENT**

**Week 1**: **SOME REAL NUMBERS** (a, b, c, d)
Definition of: Natural numbers and composite numbers

**Week 2: FACTORS AND MULTIPLES** (a, b, c, d)
Definition of: factors and multiples, LCM, GCD and HCF and their applications.
Divisibility rules.

**Week 3: INTEGERS** (a, b, c, d)
Definitions of an integer, and the real number line. Operations on the integers, and the hierarchy or order of the operations (BODMAS).

**WEEK 4: PROPERTIES OF INTEGERS** (a, b, c, d)
Definitions of the algebraic properties: commutativity, associativity, distributive property, inverse property, zero-factor property, inverse and identity properties and elements, etc.

**Week 5: FRACTIONS** (a, b, c, d)

Definition of a fraction, classification of fractions, rules for operation on fractions (+,-,×,÷), simplification of fractions, operation with mixed numbers, comparing fractions and word problems on fractions.

**Week 6: DECIMALS** (a, b, c, d)

Terminating and repeating decimals, place value and fraction, operations with decimals, rounding off decimal expressions using significant figures and decimal places. Comparing sizes of related quantities using inequalities: > or<.

**Week 7: RATIOS** (a, b, c, d)

Definition of a ratio; simplification, and word problems.

**MID-SEMESTER EXAM**

**WEEK8: PERCENTAGES** (a, b, c, d)

Definition of a percentage, percentage increase and decrease, increase followed by increase, increase followed by decrease etc. Word problems on percentage.

**Week 9: ALGEBARIC EXPRESSIONS** (a, b, c, d)

Definitions of an algebraic expression: monomial, binomial and trinomial. The degree and the leading coefficient of an algebraic expression. Operations on algebraic expressions: addition and subtraction; multiplication and division of monomials.

**Week 10: FACTORING** (a, b, c, d)

Factoring terms with a common factor, factoring terms by grouping them, by using a difference of two squares formula, and factoring quadratic expressions.

**Week 11: RATIONAL EXPRESSIONS** (a, b, c, d)

Definition of a simple rational expression, and simplification, by factoring method. Elementary operations of: +, −, ×, and ÷, on rational expressions.

**Week 12: EQUATIONS AND INEQUALITIES SOLVING** (a, b, c, d)

Definition of a linear equation, in one unkown, solving linear equations, in one unknown; solving linear inequality systems. Word problems.

**Week 13: SYSTEMS OF EQUATIONS** (a, b, c, d)

Systems of two linear equations in two unknowns; solving by elimination, and applications.

**Week 14: FINAL EXAM**

**TEACHING APPROACHES**
- o  Lectures and discussions (students are encouraged to participate)
- o  Problems solving exercises given in class.
- o  Individual assignments.
- o  Group work assignments.
- o  Quizzes.

- o Exams: mid-semester and final exam.
- o Consultations.
- o Use of the calculator in checking the obtained results.

## STUDENTS' REQUIREMENTS FOR THE COURSE

Each student will be required to adhere to the following requirements.

- o Own a scientific calculator.
- o Avoid plagiarism. Plagiarism will result into an instant F grade.
- o Avoid absenteeism from sessions of the course. Five absences will lead to an F grade.
- o There will be no make-ups. Plan to attend all the exams in the semester..

## COURSE LEARNING OUTCOMES EVIDENCES

The learning out comes evidences includes direct and indirect types as described below.

| A. **Direct** | B. **Indirect** |
| --- | --- |
| Individual assignments | Class discussions |
| Quizzes/Group work | Consultations on the weak areas |
| Exams | Course students' evaluation forms |

## COURSE TEXT

Earl W. Swokowski and Jeffrey A. Cote, Fundamentals of College Algebra, Boston Publishers.

## COURSE EVALUATION

The course evaluation for each student will be as follows.

| Attendance and participation | 5% |
| --- | --- |
| Assignments | 20% |
| Quizzes/Group work | 25% |
| Mid-semester exam | 25% |
| Final exam | 25% |
| Total score | 100% |

## GRADING SYSTEM

The grading system used applies to all the programs offered in USIU. It is as tabulated below.

| 90 – 100 | A | 80 – 83 | B | 70 – 73 | C | 62 – 63 | D |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 87 – 89 | A- | 77 – 79 | B- | 67 – 69 | C- | 60 – 61 | D- |
| 84 – 86 | B+ | 74 – 76 | C+ | 64 – 66 | D+ | 59 – | F |