**Erie Community College**

**Course Outline**

**I. Course Title:** MT125- College Mathematics

**II. Instructor Name:** Jeff Orlowski

Contact information: jorlowski@ktufsd.org

Phone Number (716)874-8402

**III. Office Hours:** Monday- Thursday 2:50-3:30

**IV. Required Texts:** Blitzer, *Algebra and Trigonometry*, Fifth Edition, Pearson Prentice Hall (with Math XL access code).

Text should be brought to each class.

**V. Prerequisites:** MT007 or MT013 or equivalent, and appropriate mathematics level code. Level code is determined by the Mathematics Department placement test and/or successful completion of mathematics courses.

**VI. Required Materials:** Scientific Calculator (TI-30xa is strongly recommended), access to internet, valid email address

**VII. Course Description:** Credit hours: 4

The first course in a two-semester sequence of college algebra and trigonometry. The sequence is preparatory for an introductory or survey level of calculus. Basic algebra skills are reviewed and extended. Functions, in general, and their inverses are studied along with the properties, graphs and transformations of linear, quadratic absolute value, radical rational, logarithmic and exponential functions. Equations of the above functions as well as linear systems of equations and linear and absolute value inequalities are solved. Related application problems are incorporated throughout.

**VIII. Course Outcomes:** Upon completion of this course, the students will be able to:

1. Apply the concepts of the real number system and the properties of real numbers.
2. Simplify and perform the fundamental operations (addition, subtraction, multiplication, and division) on real numbers, polynomials, and radical expressions; and simplify complex fractions.
3. Solve linear, quadratic, (inc. imaginary roots), absolute value, radical, exponential and logarithmic equations.
4. Solve linear and absolute value inequalities.
5. Interpret, set up and solve problems involving direct, inverse and joint variation.
6. Define function and determine whether a given relation is a function.
7. Evaluate a given function, use function notation, perform operations on functions, and the composition of functions.
8. Ascertain when a function has an inverse and be able to compute the inverse when it exists.
9. Graph, interpret the graph of functions and transformation of functions—including linear, absolute value, quadratic, cubic, radical, simple rational, exponential and logarithmic.
10. Solve systems of equations in 2 and 3 variables.
11. Interpret and apply the properties of exponential and logarithmic functions.
12. Solve word problems that involve the use of linear, quadratic, exponential and logarithmic functions and systems of linear equations.
13. TECHNOLOGY OBJECTIVES: Students will be able to demonstrate proficiency with a scientific calculator in performing the following skills:
14. Evaluating functions, various roots and exponents

b) Find Log, ln x and $e^{x}$

c) Solve exponential and logarithmic equations

**IX. ECC Learning Outcomes (LO):**

Learning Outcome 5. Quantitative Reasoning-LV3
Related Course Outcomes: 1-13
Learning Outcome 6. Technological Competence
Related Course Outcomes: 13

**ECC Graduate Learning Outcomes (GLO):** Apply appropriate mathematical
procedures and quantitative methods. Related Course Objectives: 1-13

**X. TESTING/MEANS OF EVALUATION:** Assessment of the individual student learning outcomes will be measured by a minimum of four class period tests that measure the objectives, a 1st semester exam and a 2nd semester exam.

**XI. GRADING DETERMINATION:**

* Tests 40%
* Quizzes 30%
* Weekly Reviews 15%
* Assignments 15%

**Grading Breakdown:**

 **B+** 87-89 **C+** 77-79 **D+** 67-69

**A** 93-100 **B** 83-86 **C** 73-76 **D** 60-66

**A-** 90-92 **B-** 80-82 **C-** 70-72 **F** 0-59

**XII. ATTENDANCE REQUIREMENTS:** Students are expected to be in class on time and prepared daily. Students will lose credit for any work completed during an illegal absence.

**XIII. STUDENTS WITH DISABILITIES**: Erie Community College recognizes the right of qualified individuals with disabilities to receive appropriate course accommodations and academic adjustments. These arrangements are made on a case-by-case basis. If there is a physical or mental impairment (including learning disability or Attention Deficit Disorder), which will impact the ability to participate in this class then contact the Disabled Student Services office listed below as soon as possible. A counselor will provide information to the instructor which will allow appropriate academic adjustments to be made for the student.

 City Campus: Counseling: 45 Oak: Room 102L 851-1189

 North Campus: S Bldg: Spring Center: Room 212A 851-1495

 South Campus: Bldg. 3: Room 3120 851-1933

Kenmore recognizes the right of qualified individuals with disabilities to receive appropriate course accommodations and academic adjustments. These arrangements are made through your individual special education teacher provided by the district. The students Individual Education Plan (IEP) will be followed.

**XIV: Academic Integrity and Class Policy**

Plagiarism is taken extremely serious in this course. Anyone that is caught plagiarizing someone else’s work will receive a zero on that assignment and will be subject to disciplinary action which could include removal from the class.

Cell phones are not allowed in class.  Please keep all cell phones in your purse, backpack, etc. for the duration of class.   Class lectures are not to be recorded unless permission has been given by the instructor.

**Topical Outline:**

I. Real Number System 4 days

a. Basic concepts of real numbers

b. Fundamental operations (addition, subtraction, multiplication, and division) of real numbers

c. Properties of real numbers

II. Exponents and Radicals 8 days

a. Rules of exponents

b. Fundamental Operations of radicals

c. Relationship between exponents and roots

III. Fundamental Algebraic Operations 11 days

a. Factoring and fundamental operations involving polynomials

b. Simplification of rational expressions and complex fractions

c. Fundamental operations involving rational expressions

VI. Equations 30 days

a. Linear

1. Solving Linear equations

2. Solving linear inequalities

3. Applications

i. Word problems

ii. Formulas

b. Quadratic

1. Methods of Solving Quadratic Equations

i. Factoring

ii. Completing the square

iii. Quadratic formula

iv. Operations with complex numbers

2. Applications

c. Miscellaneous Equations

1. Solving radical equations

2. Solving Equations in quadratic form

3. Solving equations with rational exponents

d. Absolute value equations and Inequalities

VII. Systems of Linear Equations 12 days

a. Solve linear equations in two variables algebraically and graphically

b. Solving linear equations in three variables algebraically

c. Cramer’s Rule (optional)

d. Applications to word problems

VIII. Functions 25 days

a. Concept of a function

b. Operations involving functions

1. Fundamental operations

2. Composition

3. Inverse

c. Variation- inverse, direct and combined

d. Symmetry

e. Graphing and transformations (shifting, stretching, shrinking and reflecting of the basic graphs)

1. Linear functions

i. slope perpendicular and parallel

ii. intercepts

2. Quadratic and Cubic Functions

3. Reciprocal Function

4. Square Root Functions

5. Absolute Value Functions

6. Piece-wise Functions

IX. Exponential and Log Functions 30 days

a. Definition of exponential and log functions

b. Properties of exponential and log functions

c. Graphing of exponential and log functions

d. Fundamental operations involving log functions

e. Exponential and logarithmic equations

f. Applications of exponential and log equations

 XI. Evaluation 2-3 days per unit

**BOOK SPECIFIC OUTLINE FOR MT 125**

**COLLEGE MATHEMATICS I**

TEXTBOOK: ALGEBRA & TRIGONOMETRY, 5th Edition

 by Blitzer (Prentice Hall)

|  |  |  |
| --- | --- | --- |
| Chapter Sectionsto be covered | Topics | Suggested Days |
| P 1 – P6Chap 3: 3.3 | PreliminariesLong division of polynomials | 25 |
| Chap1: 1.2 -1.7(1.4) Supplement with powers of i | Linear Equations & ApplicationsComplex NumbersQuadratic EquationsOther types of equationsLinear and absolute value inequalitiesInterval notation | 30 |
| Chap2: 2.1 –2.8, Chap3: 3.5, 3.7(2.2) Quickly Relative max and min (optional) Step and greatest integer (optional)(3.5) f(x) = 1/x and its transformations | Functions and Graphs Domain and rangeDifference QuotientPiecewise functionsIncreasing, decreasing, even, oddLinear functions-parallel and perpendicular linesTransformationsComposite and Inverse functionsDistance and MidpointVariation | 27 |
| Chap4: 4.1 –4.5 | Exponential and Log Functions with translationsProperties of logsExponential and log equationsApplications (growth, decay) | 30 |
| Chap 8: 8.1, 8.2 Chap 9: 9.5 (Optional) | Systems of Equations in 2 and 3 variablesSubstitutionEliminating by additionCramer’s Rule (optional) | 12 |
| Chap11: 11.1-11.3 | Arithmetic seriesGeometric seriesnth termSum of n terms | 10 |
| Supplemental | Set theoryNotationVenn diagrams | 10 |
|  | Evaluation | 2-3 days per unit  |