Crafton Hills College
Course Outline

1. **Discipline:** Mathematics

2. **Department:** Mathematics

3. **Course Title:** Intermediate Algebra Part B

4. **Course I.D.:** MATH 095B

5. **Prerequisite(s):**
   MATH 095A: Intermediate Algebra part A

   Corequisite(s): None

   Departmental Recommendation(s): None

6. **Semester Units:** 1.5

7. **Minimum Semester Hours:**

   Lecture: 16 **Lab:** 24 **Clinical:** 0 **Field:** 0 **Independent:** 0

8. **Need for the Course:**
   Success in any transfer-level mathematics course demands a knowledge of intermediate algebra. For this reason, CSU and other four-year institutions require that it be a minimum prerequisite to any mathematics course that is to be transferable. Crafton Hills has made the intermediate algebra level the minimum requirement for an AA degree. Many Crafton Hills students are unable to complete the traditional math 095 course even after repeating the course. MATH 095B, which is a lecture lab course, addresses this need. MATH 095B offers the same material in a different format to address different learning styles, provides the support of a lab component and permits more flexibility in scheduling allowing more than one semester for the same material if needed. There is a significant amount of research which shows the more time with the same format does not help the student succeed thus a different type of format is required and provided by this course. This course is Associate Degree applicable and when MATH 095ABC are completed will meet the AA degree requirement as equivalent to MATH 095.

9. **Goals for the Course:**
   MATH 095B provides the continuation of the material started in the MATH 095A part of the traditional intermediate algebra course. This course is necessary for students to be successful in the rest of MATH 095C and subsequent transferable mathematics courses. The alternative format is designed to address more varieties of learning styles and provide the student with a better chance of success. Combined with MATH 095A and MATH 095C it is equal to MATH 095 which addresses part of the quantitative analysis portion of the General Education Philosophy and minimum AA mathematics competency requirement.

10. **Catalog Description:**
    Study of rational exponents and radicals; quadratic and radical equations; complex numbers; absolute value and compound linear inequalities. MATH 095ABC is the equivalent to MATH 095. Credit cannot be granted for both MATH 095B and MATH 095. All three parts, MATH 095ABC are needed to meet the AA degree requirement.

11. **Schedule Description:**
    Study of rational exponents and radicals; quadratic and radical equations; complex numbers; absolute value and compound linear inequalities. MATH 095ABC is the equivalent to MATH 095. Credit cannot be granted for both MATH 095B and MATH 095. All three parts, MATH 095ABC are

needed to meet the AA degree requirement.

12. Entrance Skills:

A. Requisite Skills:

Upon entering this course, students must be able to:

1. Denote subsets of the real numbers
2. Use the properties of real numbers with algebraic expressions
3. Apply the order of operations to simplify, manipulate and evaluate algebraic expressions.
4. Define, evaluate, and simplify polynomials.
5. . Factor the following types of expressions with whole number exponents, common factors (including factoring out –1), grouping (two-by-two), simple trinomial, gneral trinomial, difference of squares, sum and difference of cubes, multiple step factoring.
6. Solve linear and literal equations.
7. Use the properties of integer exponents to simplify algebraic expressions.
8. Use linear equations of two variables to graph on the cateasian coordinate plane.
9. Simplify, multiply, add, subtract and divide rational expressions including: complex fractions.
10. Solve rational equations involving different denominators and extraneous roots
11. Solve first degree absolute value equations.
12. Use set and interval notation.

B. Recommended Skills:

None

13. Course Objectives:

Upon satisfactory completion of the course, students will be able to:

1. Solve and graph one variable inequalities including compound linear inequalities and absolute value inequalities.
2. Define the set of complex numbers in order to: write a complex number in standard form, evaluate powers of i, perform the arithmetic operations with complex numbers, write the conjugate of a given complex number, rationalize fractions containing complex numbers.
3. Solve quadratic equations, including complex roots, by, factoring, extraction of roots, completing the square, and the quadratic formula.
4. Graph quadratic functions by identifying, and locating the major components.
5. Apply the laws of exponents to rational exponents and relate them to radicals in order to: translate exponential notation to radical notation and radical notation to exponential notation, perform the four arithmetic operations on radical expressions.
6. Write radicals in standard form.
7. Solve radical equations including quadratic in form and extraneous roots.
8. Use one and two variables to construct a variety of models that represent a wide range of hypothetical applications appropriate to the skills listed above.
9. Write with and use proper mathematical notation for exercises within this course.

14. Representative Texts and Instructional Materials:

Gustafson, R., & Frisk, P. (2008). *Beginning and Intermediate Algebra an Integrated Approach* (5/e). Pacific Grove CA: Thompson Brooks/Cole.

Dugopolski, M. (2006). *Elementary& Intermediate Algebra* (2/e). New York NY: McGraw Hill.

Lial, M., Hornsby, J. & McGinnis, T. (2008). *Beginning and Intermediate Algebra: Graphs and Models* (3/e). San Francisco, CA: Addison Wesley.

Martin-Gay, K. Elayn (2005). *Beginning and Intermediate Algebra* (3/e). Upper Saddle River, NJ: Pearson/Prentice Hall.

Wright, F. (2004). *Intermediate Algebra* (5/e). Charleston, SC: Hawkes Learning Systems.

Video tapes and computer tutorial programs that cover the topics of this course are available in the Math Center, Learning Center and at the Reserve Desk in the library.

15. Course Content:

A. Solving and graphing absolute value and compound first degree inequalities.

B. Defining the set of complex numbers including

1. Standard form

2. Powers of i
3. Arithmetic operations with complex numbers
4. Conjugates of complex numbers
5. Rationalizing fractions containing complex numbers

C. Utilizing the laws of exponents and the relationship between rational exponents and radicals to
1. Translate exponential notation to radical notation and radical notation to exponential notation.
2. Perform the four arithmetic operations on expressions containing rational exponents and radicals.
3. Write radicals in standard form.

D. Solving equations of the following types
1. Quadratic, including complex roots by
a. Factoring
b. Extraction of roots
c. Completing the square
d. Quadratic formula
2. Radical equations including extraneous roots.
3. Equations with rational exponents including quadratic in form and extraneous roots.

E. Graphing quadratic functions and their translations using major features and symmetry.

F. Using one and two variables to construct a variety of models that represent a wide range of hypothetical applications appropriate to the skills listed above.

G. Writing with and the use of proper mathematical notation.

16. Methods of Instruction:

A. Lecture/Lab
B. Demonstration
C. Collaborative Group Work
D. Computer-aided Instruction
E. Reading Assignments
F. Guided Instruction
G. Class Discussions
H. Other: This course will combine lecture and lab activities to provide the student with alternative learning methods. It is important for any instructor teaching this course to keep the directed instruction to no more than one and one half hour per week. The lab portion of the course should consist of some combination of the following components; cooperative group interaction for working problems; reading assignments and activities from study skills texts or texts on ways to deal with math anxiety; computer tutorials component and/or other Math Center activities appropriate to the course. The lab component may incorporate individual sessions and /or group sessions. Developmental texts or software with diagnostic tests may be used to determine which topics warrant the most attention.

17. Assignments and Methods of Evaluation:

Students will be required to do at least two hours of homework for each hour of lecture. Students will be directed to show their work and write using proper mathematical notation.Homework will consist of problems chosen from the textbook, supplemental materials, or computer software. Students may also be asked to complete computer enhanced assignments, quizzes or projects, participate in in-class demonstrations, and other classroom activities appropriate for laboratory activities. A minimum of three examinations including a comprehensive final exam will be given not all of which can be take-home problems. The comprehensive final is to be written in such a manner that material from MATH 095A is incorporated. Readings and activities pertaining to study skills, mathematics avoidance and anxiety will also be required. Materials illustrating the student's growth using mathematics will be used to add to a portfolio started in MATH 095A .

Comprehensive final exam 25%-40%

Tests and quizzes 35%-70%

Mathematics portfolio 2%-5%

Homework 0%-10%

Projects and other activities 0%-10%

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