OFFICE OF CURRICULUM, INSTRUCTION, & PROFESSIONAL DEVELOPMENT

HIGH SCHOOL COURSE OUTLINE

Department	Mathematics			**Course Title**	Intermediate Algebra 1-2 SDAIE/PLS		
Course Code	3052	**Grade Level**	9-12	**Course Length**	2 semesters	**Credits/Semester**	5
Required for Graduation	No	**Meet H.S. Grad Requirement**		Yes	**Elective Credit**	Yes	
Prerequisites	A grade of "C" or better in Pre-Algebra, ELD English 0, 1 & 2						
Articulated with LBCC	No	**Articulated with CSULB**		No			
Meets UC "a-g" Requirement	No	**Meets NCAA Requirement**		No			
Teacher Certification	BCLAD, BCC or CLAD, LDS, SB 1969 or SB 395 and a Bilingual Aide						

COURSE DESCRIPTION:

Intermediate Algebra SDAIE is designed for English Language Learners who are at the Intermediate and Early Advanced levels of oral, reading and writing in English. English Language Learners in this SDAIE course cover the same content and utilize the same basic textbook as their Fluent English Speaker counterparts. The course varies in the pacing, instructional methodology and supplemental materials used which are designed to provide depth vs. breadth of the content standards, more comprehensible input, and literacy development through the content area.

The course reviews the applications and language of the first year with increased emphasis on number systems, functions, and graphs. Language and symbolism are expanded to encompass new concepts. The content includes such topics as relations and functions, quadratic equations, conic sections, matrices, logarithms, and sequences and series.

GOALS: (Student needs the course is intended to meet)

Students will understand the structure of the systems of real and complex numbers, understand the concept of functions and their unifying role in mathematics, acquire facility in applying algebraic concepts and skills, and be able to analyze and graph a variety of functions.

PERFORMANCE OBJECTIVES:

Students will:

- Recognize real and complex number systems and apply mathematical properties and operations to them.
- Find the solution sets of algebraic equations.
- Convert word problems to algebraic equations and find the solution set.
- Describe and plot graphs of relations and functions.
- Recognize and apply the relationship between roots and coefficients of a quadratic equation
- Determine the nature of the roots of a quadratic equation.
- Factor and perform the four basic operations on polynomial expressions.
- Apply rules involving fractional and negative exponents.

Academic Literacy in SDAIE Content-Area Classes for ELLs at Levels 3 and 4L

The ELD Standards of reading, writing, listening and speaking describe the linguistic pathway that ELLs take to achieve academic literacy in English. SDAIE content area classes play an important role in developing and strengthening students' progress towards this goal. Students should be encouraged to expand their English skills, even though grammatical and vocabulary approximations will occur during this process.

When content-area information and materials have been made comprehensible through instruction in the SDAIE class, ELLs at each level will progress through the following phases of developing academic literacy in English. The students' degrees of literacy in their primary language will significantly affect the pace that students move through these levels.

ELD Level 0

Upon entering ELD Level 0, students have little or no academic English proficiency and have **little or no literacy skills in their first language**. ELLs progressing through this level will:

- Participate in modified group/class projects, discussions and oral presentations with non-verbal responses (e.g., gestures, drawings, graphic organizers) and/or single words or phrases with assistance (e.g., word walls, language structure walls)
- Begin to participate orally in some content area reading strategies (especially pre-reading, KWL, and anticipation guides presented orally), with single words or phrases to analyze concepts from explicitly taught texts and other course reading materials
- Respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) non-verbally (e.g., graphic organizers with drawings) and/or orally with single words or phrases
- Begin to use the English alphabet to write in teacher-guided learning logs, selected homework and interactive notebooks, and to organize and record expository information on pictures, lists, charts and tables using single words or phrases
- Understand the need for using modified test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), and STAR.

ELD Level 1

Upon entering ELD Level 1, students have little or no academic English proficiency and varying levels of academic literacy skills and concepts in their first language. ELLs progressing through this level will:

- Participate in group/class projects, discussions and presentations with non-verbal responses (e.g., gestures, drawings, graphic organizers, role-playing) and/or single words, phrases and simple sentences with assistance (e.g., using the academic participation cards).
- Participate orally in some content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides) with single words, phrases and/or simple sentences to analyze concepts from taught texts and other course reading materials.
- Respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) nonverbally (e.g., graphic organizers with drawings) and/or orally with single words, phrases and simple sentences in an outline format.

- Use writing in a variety of ways such as, but not limited to, guided class note-taking, learning logs, interactive notebooks, representing information on pictures, lists, charts and tables using single words, phrases or simple sentences, and completing student handouts, selected homework, and modified class projects.
- Understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), and STAR.

ELD Level 2

Upon entering ELD Level 2, students have some academic English proficiency about topics that have been explicitly taught to them. ELLs progressing through this level will:

- Participate in group/class projects, discussions and presentations with simple sentences and many attempts at more complex sentences.
- Use content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides, Reciprocal Teaching and Question/Answer Relationships) to analyze concepts from taught texts and other course reading materials.
- Respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) orally and with simple and some complex sentence structures in at least three paragraphs.
- Use writing in a variety of ways such as, but not limited to, class note-taking, learning logs, interactive notebooks, response logs, and completing student handouts, homework, and class projects.
- Understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), and STAR.

OUTLINE OF CONTENT AND RECOMMENDED TIME ALLOTMENT:

Content sequencing and time allocations are only suggestions and may be adjusted to suit school site curriculum plans and student needs.

Symbols used in this document:

H – Heath, Algebra 2 textbook
G – Glencoe, Algebra 2 textbook
( ) - Indicates California State Framework Reference

Linear Equations and Inequalities, and Matrices

Topics	Curriculum Objectives California State Standards	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
Solve linear equations and inequalities; write equations of lines using the properties of parallel and perpendicular lines; and use the distance	Solve linear equations and inequalities	H 1.3, 1.6 G 1-4, 1-6	Pgs. 34 - 36	Open sentence Equations Solution Reflexive prop of equality Symmetric prop of equality Transitive prop of equality	3 Weeks
	Slope-intercept, point-slope, and standard form of linear equations	H 2.4 G 2-4			
	Writing the equation of a line given various information	H 2.4 G 2-4			
	Parallel and perpendicular lines and their related equations	H 2.2 G 2-3			

Topics	Curriculum Objectives California State Standards	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
formula.	Literal equations and formulas	H 1.5 G 1-1		Substitution prop of equality Add/subt prop of equality Mult/div prop of equality Trichotomy prop Add/subt prop of inequality Mult/div prop of inequality slope intercept form of a linear equation point-slope form of a linear equation slope parallel lines perpendicular lines order of operationsalgebraic expressions formula distance midpoint absolute value compound inequality intersection union	0.5 weeks
	Distance formula	H 7.5 G 7-1			
Solve absolute value equations and inequalities.	Solve absolute value equations and inequalities **(1.0)**	H 1.7 G 1-5, 1-7	Pgs. 37, 38		

Quadratics, Complex Numbers, Functions, and Polynomials

Topics	Curriculum Objectives California State Standards	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
Understand and use quadratic equations and relations.	Graph quadratic equations (including inequalities) **(9.0)**	H 5.2, 5.7 G 6-1	Pgs. 49 - 52	Quadratic Parabola Quadratic function Quadratic term Linear term Constant term Zeros Axis of symmetry Vertex Roots Location principal Relative maximum	3 Weeks
	Maxima, minima, and zeros **(10.0)**	H 9.5 G 8-3			
	Solve quadratic equations by factoring, completing the square, using the quadratic formulas, and graphing **(8.0)**	H 5.3 to 5.6 G 6-2 to 6-4			
	Use of the discriminant	H 5.4 G 6-4			

Topics	Curriculum Objectives California State Standards	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
				relative minimum Completing the square Perfect square Quadratic formula Discriminant	
Real and Complex Number Systems	Rational and irrational numbers **(5.0)**	H 1.1 G 1-2	Pgs. 48,49	Real numbers Rational numbers Irrational #'s Field properties Closure Commutative Associative Identity Inverse Distributive Imaginary #'s Complex #'s Real axis Imaginary axis	2 weeks
	Real numbers and field properties **(5.0)**	H 1.1 G 1-2			
	Imaginary numbers **(5.0)**	H 5.5 G 5-9			
	Operations with complex numbers **(6.0)**	H 5.5 G 5-9, 5-10			
	Graphs of complex numbers as points in the plane **(5.0)**	H 5.5 G 5-9			
Functions	Functions and relations, function notation	H 6.1 G 2-1	Pgs. 16, 17, 53 - 55	Function Inputs Domain Outputs Range Mapping diagram Function notation Evaluate Composition of functions Compound functions Absolute value function Step function Direct variation Inverse variation Joint variation	3 weeks
	Domain and range of functions	H 6.1, 6.2 G 2-1			
	Direct, inverse and joint variation	H 10.2 G 2-6, 9-2			
	Composition and inverse of a function **(24.0)**	H 6.2 G 8-7, 8-8			
	Combination and simplification of functions **(25.0)**	H 6.2 G supplement			
	Special functions (step, absolute, square root, etc.)	H 6.4 G 2-6, 8-8			
Polynomials	Operations with polynomials (addition, subtraction, multiplication, long division) **(3.0)**	H 9.1 G 8-2	Pgs. 45 – 47	Polynomial: linear, quadratic, cubic Polynomial: degree, leading coefficient, Standard form Monomial Binomial Trinomial Foil Sum and difference Square of a binomial	2 Weeks
	Factoring using the difference of two perfect squares, trinomials, and the sum and difference of two cubes **(4.0)**	H 9.3 G 5-2, 5-4, 6-3			

Topics	Curriculum Objectives California State Standards	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
				Cube of a binomial Sum/difference of cubes Remainder theorem Synthetic division Zeros	

Logarithms and Exponents, Rational Expressions and Equations

Topics	LBUSD Curriculum Objective	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	
Logarithms and Exponents	Proof of simple laws of logarithms **(11.0)**	H 8.3 G 10-3	Pgs. 57 - 59	Rational exponents Radical Simple interest Initial Principle Compound interest Quarterly Exponential growth/decay Radical equation Extraneous Shift Logarithm Base Common/natural logarithm Logistics growth Function Horizontal Asymptote	3.5 weeks
	Simplification of expressions using the properties of exponents and logarithms **(11.0)**	H 8.4 G 10-1 to 10-3			
	Solution of equations with exponential and logarithmic expressions **(14.0)**	H 8.3, 8.6 G 10-6			
	Graphs of exponential and logarithmic functions	H 8.1, 8.2 G 10-1, 10-2			
	Exponential growth and decay **(12.0)**	H 7.2, 8.1 G 10-7			
	Solutions of problems involving logarithms and exponents **(12.0)**	H 8.1, 8.2, 8.6, 8.7 G 10-2			
	Natural logarithms and the number *e*	H 8.4, 8.5 G 10-5			
	Radical expressions and equations **(14.0)**	H 7.5 G 5-6, 5-8			
	Rational exponents **(12.0)**	H 7.3 G 5-7			
Rational Expressions and Equations	Simplifying, adding, subtracting, multiplying and dividing rational expressions **(7.0)**	H 10.3 G 9-3, 9-4	Pgs. 60 - 61	Rational expression Fraction Numerator Denominator Least common denominator Least common multiple Complex fraction	2 weeks
	Fractional equations and applications	H 10.4 G 9-5			
	Simplifying complex fractions **(7.0)**	H 10.5 G 9-3, 9-4			

Conics, Sequences and Series, and Probability and Statistics

Topics	LBUSD Curriculum Objective	Adopted Textbook Correlation	Assessments Intermediate Algebra Assessment Portfolio Workbook	Key Vocabulary	Time
Conic Sections	Identification of the conic section: circle, ellipse, parabola or hyperbola **(17.0)**	H 11.1, to 11.4 G 7-2 to 7-6	Pgs. 18 – 23, r 63 - 66	Conic section Focus Directrix Latus rectum Center Radius Tangent Major/minor axis Vertex Asymptotes Transverse axis Conjugate axis Axis of symmetry	2.5 weeks
	Relationship of the graph of a conic section to the coefficient of the quadratic equation representing it (e. g. asymptotes, foci, eccentric, etc.) **(16.0)**	H 11.5 G 6-6, 7-2, 7-5			
	Solution of quadratic systems	H 11.6 G 7.7			
Sequences and Series	Arithmetic and geometric sequences	H 12.2, 12.3 G 11-1, 11-3, 11-6	Pgs. 24 – 32, 67 - 68	Sequence Terms/nth term Summation or sigma notation Series Index/limits of summation Fibonacci sequence Arithmetic/geom sequences and series Common difference/ratio Finite/infinite Binomial theorem Binomial expansion Pascal's triangle	3 weeks
	Arithmetic and geometric series (finite and infinite) **(22.0)**	H 12.2, 12.3 G 11-2, 11-4			
	Sigma notation **(23.0)**	H 12.1 G 11-5			
	Pascal's triangle	H 12.5 G 11-8			
	Binomial Theorem **(20.0)**	H 12.5 G 11-8			
	Fractals (optional)	H 5.5 G 11-7			
Probability and statistics	Computation of combinations and permutations using the fundamental counting principles (18.0)	H 15.2, 15.3 G 12-1 to 12-3	Pgs. 69, 70	Fundamental counting principle Probability Combination Permutation Factorial Elements Inclusive/exclusive Mutually Union Intersection Dependent Independent	2 weeks
	Use of combinations and permutations to compute probabilities (19.0)	H 15.4, 15.5 G 12-2 to 12-4			

METHODS: A variety of instructional strategies will be utilized to accommodate all learning styles and to reinforce reading, writing, and mathematical skills while learning the advanced algebra content. Methods of instruction include but are not limited to lectures, discussions, demonstrations, student presentations, computer programs, group and individual work, videos, manipulatives, projects, and explorations.

Reading Strategies in Mathematics
- Learning Logs
- Pre-teaching
- Vocabulary
- Pre-reading
- Text Structures
- Trail Markers
- Reciprocal Teaching
- Functional Text
- Anticipation Guide

SDAIE Strategies for English Learners
- Tapping/Building Prior Knowledge (Graphic Organizers, Schema)
- Grouping Strategies
- Multiple Intelligences
- Adapt the Text
- Interactive Learning (Manipulatives, Visuals)
- Acquisition Levels
- Language Sensitivity
- Lower the Affective Filter (including Processing Time)
- Home/School Connection (including Cultural Aspects)

- ***Differentiation for Advanced Learners***
- Curriculum Compacting
- Tiered Assignments
- Flexible Grouping
- Acceleration
- Depth and Complexity
- Independent Study

Primary Language Support
- Preview/review Grouping
- Parallel Texts
- Cognates

MATERIALS USED IN TEACHING THE COURSE: In addition to the basic text, a variety of instructional tools will be used to meet the needs of all students.

Basic Text: Heath Algebra 2: An Integrated Approach; Larson, 1998; Heath/McDougal Littell
Glencoe Algebra 2: Integrations-Applications-Connections; Collins, 1998; Glencoe

Supplemental materials:

Resources accompanying the basic text:

- Formal Assessment, Spanish Edition; Larson, 1998: Heath/McDougal Littell
- Reteaching Copymasters, Spanish Edition; Larson, 1998; Heath/McDougal Littell
- Color Transparencies Real Life Applications; Larson, 1998; Heath/McDougal Littell

Support for English Language Learners:

- Hands on activities and projects
  (Algeblocks, Hands on Equations or Algebra Tiles available from ETA/Cuisenaire)
- Supplemental audio/visual content materials
- Computer resources available through software and the Internet (Larsons Algebra I by Meridian)
- Posters and models

EVALUATION: Student achievement in this course will be measured using multiple assessment tools including but not limited to chapter tests, cumulative tests (final exam), quizzes, homework, classwork, notebooks, portfolios, projects, and open ended questions.

GRADING POLICY: A common grading policy ensures consistency between schools and classrooms across the district.

Suggested Percent of Grade

Chapter Tests	35% - 40%
Quizzes	25% - 30%
Cumulative Tests which Includes the district Final Exam and site common assessments	10% - 15%
Classwork	5% - 10%
Homework	10%
Notes/Projects	5%

Suggested Grading Scale

A 90% - 100%
B 80% - 89%
C 70% - 79%
D 60% - 69%
F Below 60%

Submitted by: OCIPD
School:
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