SAN LEANDRO UNIFIED SCHOOL DISTRICT
COURSE PROPOSAL: Course of Study
SECTION A. COVER PAGE

1. **Course Title:** Intensive Algebra Year 1	7. **Action** X New Course ▢ Course Revision ▢ Title Change Only
2. Date Submitted:	8. **Grade Level**(s) ▢ 6 ☒9 ▢11 ▢ 7 ▢10 ▢12 ▢ 8
3. Transcript Title/Abbreviation(s) Intensive Alg 1	**9. Prerequisites** (Please list.) ▢ Required ▢ Recommended
4. Transcript Course Code/Course Number : 2188 (Intensive Algebra 1)	**10. Seeking Program Distinction?** ▢ YES (Check one below.) ☒NO ▢Honors ▢ AP ▢Other
5. Subject Area Mathematics	11. **Is this a CTE course?** ▢ YES ☒ NO **If YES, complete Section C**
6. **Department** Mathematics	12. **Previously approved by UC?** ▢ YES ☒ NO ▢ NA for 6th-8th **For high school math credit only.
13. UC ELIGIBILITY **Already eligible?** ▢ NA for 6th-8th ▢**YES** **xNO** **a** ▢ **b**▢ **c**▢ **d**▢ **e**▢ **f**▢ **g**▢ **Proposing eligibility?**▢ NA for 6th-8th ▢**YES** ☒**NO** **a** ▢ **b**▢ **c**▢ **d**▢ **e**▢ **f**▢ **g**▢ Please mark one for approved eligibility or proposed eligibility.	14. **Unit Value/Course Credit/Length of Course** ▢ 0.5 (semester or half-year ☒ 1.0 (one year equivalent) ▢ 2.0 (two-year equivalent) ▢ Other
15. School Contact and Course Developer Name: Celine Liu Phone: 510-667-6215 Email: cliu@slusd.us Position: Coordinator	
	DISTRICT OFFICE USE ONLY **Date approved by Board Curriculum Committee 5/20/19** **Date approved by Board**

16. Approval Signatures:	Approval Date:
Department Chair	5/20/19
Principal:	

SECTION B. COURSE CONTENT

17. Course Description

Intensive Algebra is a 9th grade course designed to address pre-algebraic and algebraic standards in the context of a problem-solving framework. Intensive Algebra will be taught in units designed to develop mathematical identities and a growth mindset towards learning and doing mathematics. The course will review the number system, ratios and proportional relationships, expressions and equations, functions, and geometry, laying the foundation for Algebra 1 coursework. Upon successful completion of Intensive Algebra, students will be prepared to enroll in Algebra 1.

18. Course Goals and/or Major Student Outcomes

- Foster a growth mindset regarding students' abilities in mathematics
- Support development of mathematical agency, authority, and ownership
- Strengthen student proficiency in the Standards for Mathematical Practice
- Strengthen student proficiency in the pre-algebraic content standards needed for success in Algebra 1

19. Course Objectives (standards)

8.EE.A Work with radicals and integer exponents.
8.EE.B Understand the connection between proportional relationships, lines, and linear equations.
8.EE.C Analyze and solve linear equations and pairs of simultaneous linear equations.
8.F.A Define, evaluate, and compare functions.
8.F.B Use functions to model relationships between quantities.
8.G.A Understand congruence and similarity using physical models, transparencies, or geometry software.
8.G.B Understand and apply the Pythagorean Theorem

7.RP.A Analyze proportional relationships and use them to solve real-world and mathematical problems.
7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
7.EE.A Use properties of operations to generate equivalent expressions.
7.EE.B Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers.
6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.
6.EE.B Reason about and solve one-variable equations and inequalities.
6.EE.C Represent and analyze quantitative relationships between dependent and independent variables.

20. Course Outline

Unit 1: Rigid Transformations and Congruence
Students extend their geometric reasoning to plane figures with different rotation and mirror orientations. They experimentally verify the properties of translations, rotations, and reflections, and use these properties to reason about plane figures, understanding informal arguments showing that the alternate interior angles cut by a transversal have the same measure and that the sum of the angles in a triangle is 180 degrees.

Unit 2: Dilations, Similarity, and Introducing Slope
Students deepen understanding of "scale factor" and engage with "dilation" and "center of dilation" to extend and use their knowledge of geometry and geometric measurement. They use understanding of transformations, including those in sequence, to justify claims of similarity or non-similarity. Similar triangles lead to the concept of slope and a slope triangle.

Unit 3: Linear Relationships
In this unit, students gain experience with linear relationships and their representations as graphs, tables, and equations through activities designed and sequenced to allow them to make sense of problems and persevere in solving them. They revisit different representations of proportional relationships, connect to rate of change in applied contexts, and begin to explore lines with negative y-intercepts and rates of change. As a conclusion to this unit, students graph two unknowns and begin to develop understanding of solutions to this type of problem.

Unit 4: Linear Equations and Linear Systems
Building on work from grades 6 and 7 with equivalent expressions and equations with one variable, students extend their ability to solve equations with multiple occurences of a single variable, and begin using algebraic methods to solve systems of linear equations in two variables.

Unit 5: Functions and Volume
Students are introduced to the concept of a function, using relationships from previous grades (perimeter formulas, proportional relationships, linear relationships) to express them as functions. The unit ends with a focus on linear and piecewise linear functions, which students use to model quantities in real-world situations including volume.

Unit 6: Associations in Data

Students analyze bivariate data—using scatter plots and fitted lines to analyze numerical data, and using two-way tables, bar graphs, and segmented bar graphs to analyze categorical data.

Unit 7: Exponents and Scientific Notation
Students build specifically on grade 6 work with exponent notation and expressions. Using this understanding, they develop rules for working with exponents, and then connect to scientific notation. The bulk of this unit focuses on communicating, estimating, and reasoning with quantities that include exponents, and especially those with integer or non-integer multiples of powers of 10--in the context of application problems.

Unit 8: Pythagorean Theorem and Irrational Numbers
This unit builds on and connects to students' understanding of geometry and numerical expressions. Students will use geometric representations of length and area in order to lead into proofs of the Pythagorean Theorem and develop understanding of rational and irrational numbers. They will extend previous work on decimal representation of fractions to represent rational and irrational numbers in decimal form.

21. Instructional Materials:

Board approved required text

- Eureka Math

Supplementary materials

- EdGenuity
- Agile Mind
- Illustrative Math (Open Up Resources)

22. Instructional Methods and/or Strategies (Key Assignments)

Instructional methods will incorporate collaborative learning structures within a problem-solving framework in order to support the 3 components of rigor associated with the CA Common Core State Standards for Mathematics (conceptual understanding; procedural fluency; and application). Whole group direct instruction will be supplemented with small group instruction based on assessment data (such as STAR Math), along with incorporation of technology platforms (ex: Desmos, the graphing platform used on the Smarter Balanced Assessment) to provide individualized learning pathways for students based on their demonstrated understanding and needs.

Specifically, instructional methods from this course include:

- *Anticipate, Monitor, Select, Sequence, and Connect* student work and thinking from *Five Practices for Orchestrating Productive Mathematical Discussions* (Smith & Stein, 2011)

- *Group presentations*: students work in small groups to solve a problem with mathematical modeling, invent a new problem, design something, or organize and display data, and then create a visual display of their work.

- *Notice and Wonder*: Students are shown some media or a mathematical representation. The prompt to students is "What do you notice? What do you wonder?" Students are given a few minutes to write down things they notice and things they wonder. The purpose is to lower the bar for entry into a mathematical task for all students with these two low-stakes questions; by thinking about them and responding, students gain entry into the context and might get their curiosity piqued.. Note: Notice and Wonder and I Notice/I Wonder are trademarks of NCTM and the Math Forum.

- *Number Talks*: One problem is displayed at a time. Students are given a few minutes to quietly think and give a signal when they have an answer and a strategy. The teacher selects students to share different strategies for each problem, "Who thought about it a different way?" Their explanations are recorded for all to see. Students might be pressed to provide more details about why they decided to approach a problem a certain way. It may not be possible to share every possible strategy for the given limited time; the teacher may only gather two or three distinctive strategies per problem. Problems are purposefully chosen to elicit different approaches, often in a way that builds from one problem to the next. Number talks build computational fluency by encouraging students to think about the numbers in a computation problem and rely on what they know about structure, patterns, and properties of operations to mentally solve a problem.

- *Poll the Class*: Every student in class reports a response to a prompt. Teachers need to develop a mechanism by which poll results are collected and displayed so that this frequent form of classroom interaction is seamless. Going on record with an estimate or a gut reaction makes people want to know if they were right and increases investment in the outcome.

- *Take Turns*: students work with a partner or small group. They take turns in the work of the activity, whether it be spotting matches, explaining, justifying, agreeing or disagreeing, or asking clarifying questions. If they disagree, they are expected to support their case and listen to their partner's arguments. Building in an expectation, through the routine, that students explain the rationale for their choices and listen to another's rationale deepens the understanding that can be achieved through these activities. Specifying that students take turns deciding, explaining, and listening limits the phenomenon where one student takes over and the other does not participate.

- *Which One Doesn't Belong*: Students are presented with four figures, diagrams, graphs, or expressions with the prompt "Which one doesn't belong?" Typically, each of the four options "doesn't belong" for a different reason, and the similarities and differences are mathematically significant. Students are prompted to explain their rationale for deciding that one option doesn't belong and given opportunities to make their rationale more precise. Which One Doesn't Belong fosters a need to define terms carefully and use words precisely in order to compare and contrast a group of geometric figures or other mathematical representation.

23. Assessment Methods and/or Tools

Formative Assessments:

- Number Talks/Warm-Up routines
- STAR Math assessments
- Student work and discussion on classroom tasks. These may include problems that may require several class periods due to the cognitive rigor and demand of demonstration of Standards for Mathematical Practices required. "Problem-based learning" is a manifestation of the Project Based Learning focus of SLUSD, ensuring the maintenance of cognitive rigor and complexity of the math content standards while still attending to the application and context for learning mathematics that will support college- and career readiness for our graduates
- Group and individual quizzes
- Exit tickets

Summative assessments

- Unit tests
- Class projects

24. Grading Policy

Grading will follow the San Leandro Unified School District's policy