

## Ensuring Teacher Quality: Algebra II

This course will focus on the topics following a TEKS-aligned suggested scope and sequence for Algebra II. The course will take place over a period of 15 days for 4 hours each day. It is suggested that any pretesting of participants take place either the day before the course officially begins or on the morning of the first day if the course is offered in the afternoons.

### TIMELINE FOR INSTRUCTION (SYLLABUS)

*(Note: it is assumed that participants will have the Algebra II professional development course materials printed from ETQ: Algebra II.)*

<b>Date</b>	<b>Instruction Concepts</b>	<b>Materials</b>
Day 0	Pretesting of Participants (content knowledge, pedagogy)	Evaluation instruments
Day 1	(Algebra II) <b>Foundations of Functions:</b> function notation, inverses, transformations, and graphical representations. Topic 1.1, Tasks 1.1.1–1.1.3 Homework: Journal (Strand 0)	Graphing calculator Graphing calculator overhead Viewscreen Transparencies Transparency pens Markers Wall chart paper Patty paper
Day 2	(Algebra II) <b>Foundations of Functions</b> , continued Topic 1.2 Tasks 1.2.1–1.2.4 Discussion: Creating rich mathematical tasks from ordinary textbook problems Homework: Tasks 1.2.5, 1.3.1–1.3.2	Graphing calculator Transparencies Transparency pens Markers Wall chart paper
Day 3	(Algebra II) <b>Foundations of Functions</b> , continued Presentations of Tasks 1.3.1–1.3.2 Topic 1.3, Tasks 1.3.3–1.3.5 Topic 1.4, Tasks 1.4.1–1.4.3 Homework: Tasks 1.3.6–1.3.7 Discussion: Readings on strategies for struggling learners in Algebra	Graphing calculator Graphing calculator overhead Viewscreen Colored paper Patty paper Transparencies Transparency pens Markers Large grid chart paper

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Date	Instruction Concepts	Materials
Day 4	<b>Linear Functions:</b> slope as a rate of change, algebraic and geometric modeling, direct proportions Topics 2.1–2.4	Graphing calculator Flip chart with ruled squares Colored markers Masking tape Meter sticks (straightedge)
Day 5	<b>Linear Functions</b> , continued: matrices, linear programming Discussion: Linear functions overview from previous day <b>Participant presentations of tasks</b> created for classroom use related to Foundations of Functions and Linear Functions.	MATPLOT program Graph paper Inequal APP for calculator (optional) Geometer’s Sketchpad (optional) Chart paper Markers Rulers
Day 6	<b>Quadratic Functions:</b> applications that are modeled by quadratic functions, solving quadratics, complex numbers, iteration, predictions from data.	Graphing calculator Motion detector Ball (basketball or racquetball) Transparencies Transparency pens Markers Chart paper
Day 7	<b>Quadratic and Square Root Functions:</b> inverse functions, applications-based activity modeled by square root function, simplifying radical expressions, rationalizing.	Graphing calculator Patty paper String Washers Timers Tape measures or meter sticks Compasses Large grid chart paper
Day 8	Discussion: Creating rich mathematical tasks from ordinary textbook problems <b>Polynomials and Rational Functions:</b> polynomials, power functions, rational functions, asymptotes/end behavior, removable discontinuities, applications	Graphing calculator Large grid chart paper

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Date	Instruction Concepts	Materials
Day 9	Discussion: Reflect and Apply Activity Discussion: Readings on strategies for struggling learners in Algebra <b>Polynomials and Rational Functions:</b> continued from previous day	Graphing calculator
Day 10	Discussion: Reflect and Apply Activity <b>Participant presentations of tasks</b> created for classroom use related to quadratics, square root functions, and rational functions.	Graph paper Transparencies Graphing calculator
Day 11	<b>Exponentials and Logarithms:</b> introductory activity; discovering the algebra of exponentials and logarithms, applications-based activities.	Graph paper Transparencies Transparency pens Chart paper Thermometers or CBL2 Data Collection Device (instructor) Pint-size plastic containers or 8-oz Styrofoam cups Hot water Stopwatches
Day 12	Discussion: Creating rich mathematical tasks from ordinary textbook problems <b>Exponentials and Logarithms:</b> applications-based activities, exploration of properties of exponentials and logarithms.	Graph paper Transparencies Transparency pens Chart paper Thermometers or CBL2 Data Collection Device (instructor) Pint-size plastic containers or 8-oz Styrofoam cups Hot water Stop watches

### TIMELINE FOR INSTRUCTION (SYLLABUS)

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Date	Instruction Concepts	Materials
Day 13	Discussion: Readings on strategies for struggling learners in Algebra <b>Conic Sections</b>	Scissors Tape Template run on cardstock (7.1.1) Transparencies 1–4 Chart paper Markers Colored pencils Graphing calculator <b>Conics APP</b> for TI-83 Plus Chart paper Transparencies of templates (7.2.1)
Day 14	<b>Conic Sections</b>	Graphing calculator Chart-sized grid paper Blank transparencies Poster markers Transparency markers Transparencies 1,2 Transparencies 3,4 Transparency of program <b>CONIC</b> Transparency of program <b>CONICSTU</b> Program <b>CONIC</b> for TI-83 Plus Program <b>CONICSTU</b> for TI-83 Plus <b>Conics APP</b> for TI-83 Plus
Day 15	<b>Participant presentations of tasks</b> created for classroom use related to exponentials and logarithms, conic sections. <b>Final overview</b> of concepts studied. Post-testing of content knowledge.	LCD projection device, overhead projector  Content knowledge evaluation instrument

Course grade will be determined using a qualitative scoring rubric on homework tasks, assessments, participant presentations and participation.