Learning and doing algebra **(ME322)** *content listing*

Unit 1 *The nature of algebra*	You'll meet some definitions of school algebra and algebraic thinking. You'll tackle problems that approach algebra as a way of exploring and expressing generality. You'll read about moving between well-chosen examples and generalisations and appreciating the role of freedoms and constraints. Additionally, you'll develop algebraic expressions for simple numerical problems and encounter ideas from research and classroom practice about learning to interpret and treat algebraic symbols.
Unit 2 *Representing structural relationships*	You'll tackle problems involving making your algebraic conjectures and convincing yourself when these are true. Taking an approach that algebra is a way of noticing underlying structure, you'll meet a range of early-algebraic representations used in classrooms, such as bar models and Cuisenaire rods. You'll read about choosing algebraic representations and work on problems with a learner.
Unit 3 *The power of symbolising*	This unit focuses on the power of using algebra symbols and the difficulties people experience. You'll reflect on the choices we make when symbolising and how symbols help create convincing proofs. Additionally, you'll meet the module idea 'Manipulate, Get a sense of, Articulate' that connects learning progression with choice of representations.
Unit 4 *Equivalence and the equals sign*	You'll read and tackle problems that help you to notice different ways in which numeric and algebraic expressions can be equivalent, including how learners use the equals sign. You'll meet two new module ideas: 'Doing and undoing' underpins some widely used methods of solving linear equations; 'Productive lingering' describes how teachers take time over small steps of algebraic reasoning. You'll also undertake a project where you adapt a given task and work on it with your learner.
Unit 5 *Invariance and change*	You'll focus on algebraic thinking as noticing change and, amidst this change, expressing properties or relationships that stay the same. You'll tackle problems that require you to organise and represent change in one or more variables, particularly sequences problems. Additionally, you'll create a presentation that identifies invariance and change in your algebraic reasoning.
Unit 6 *Covariant relationships*	This unit focuses on covariation: how two or more variables change in relation to one another. You'll tackle problems involving algebraic expressions and graphs. You'll also learn to use Cornerstone Maths and Geogebra, two digital environments designed for education, to depict covariant relationships and reflect on the affordances of different representations.
Unit 7 *Exploring functions and graphs*	You'll focus on functions, including the properties and contexts that give rise to linear, quadratic and exponential functions. Then, having now met all the module ideas, you'll choose appropriate ones to identify algebraic thinking in your own mathematics and that of your learner. This forms the basis of your end-of-module assessment.
Unit 8 *Progressing to geometry*	This final unit makes connections between algebra and geometry, supporting progression to Learning and doing geometry ME321.