Learning Outcomes for Modern Algebra II, MATH-41002

Knowledge

Define main algebraic structures involved (rings, integral domains, fields, ideals, quotient rings, maximal and prime ideals, vector spaces, field extensions) and formulate their properties; formulate main properties of the polynomial ring; formulate main results proved in the course.

Comprehension

Understand the construction of the quotient ring and the role of ideals in that construction; give examples of all the algebraic structures involved in the course; understand the proofs of the main results proved in the course.

Application

Solve a variety of problems related to material covered; understand main theorems and properties and constructions of ring theory when applied to the ring of polynomials; apply the results about filed extensions to the questions of constructability of real numbers

Analysis

Analyze structure and properties of particular rings and fields. Use examples to make conjectures about general situations; break complicated problems into small parts and relate them to the results proved in the course.

Synthesis

Apply new material to matrices, complex numbers, and other structures learned earlier in Linear Algebra, Calculus and other classes.

Evaluation

Be able to decide how to approach a particular problem or example, based on previous experience and knowledge. Understand that a problem may have a few correct solutions.

Class Activities

Solve problems, prove theorems, apply theorems and other results to concrete examples.

Out of class Activities

Work on weekly homework assignments.