Math 112 Syllabus

From the Math Department website:[1]

- Equations and inequalities
- Functions; composition of functions; inverse functions
- Maximum and minimum problems
- Exponential and logarithmic functions
- Compound interest, including continuous compounding
- Graphs of polynomials, rational functions, logarithms and exponentials
- Complex numbers
- Division of polynomials
- Remainder Theorem and Factor Theorem
- Arithmetic sequences and series
- Geometric sequences and series
- Systems of linear equations
- Gaussian elimination
- Introduction to matrices
- Nonlinear systems of equations

From the Letters and Science Course Catalog:[2]

> *Course Description: Polynomial equations, remainder and factor theorems, functions, graphs of functions, simultaneous linear equations, logarithm and exponential functions, sequences and series, mathematical induction, binomial theorem.*

Current contents of UWCABook:[3]

[1] We can alter this.
[2] I think it we can alter this without too much bureaucratic effort.
[3] Sections marked with * can be omitted.

5 1.2 Relations 24 section 1.2

5 1.3 Graphs of Equations 32 section 1.3

6 1.4 Three Interesting Curves 44 section 1.4

7 2.1 Introduction to Functions 71 section 2.1

7 2.2 Function Notation 81 section 2.2

8 2.3 Function Arithmetic 91 section 2.3

8 2.4 Graphs of Functions 98 section 2.4

9 2.5 Transformations 118 section 2.5 (omit rescaling)

10 3.1 Linear Functions 147 section 3.1

10 3.2 Absolute Value Functions 163 section 3.2

11 Word problems (Defining functions)

EXAM

12 3.3 Quadratic Functions 175 section 3.3

13 3.3 Optimization of Quadratic Functions 175 section 3.3

14 3.4 Inequalities 190 section 3.4

15 4.1 Graphs of Polynomials 207 section 4.1

16 Polynomial division

17 4.2 The Factor Theorem and The Remainder Theorem 227 section 4.2

18 5.1 Introduction to Rational Functions 239 section 5.1

19 5.2 Graphs of Rational Functions 255 section 5.2

19 5.3 Rational Inequalities and Applications 276 section 5.3

20 6.1 Function Composition 289 section 6.1

21 6.2 Inverse Functions 303 section 6.2

22 6.3 Other Algebraic Functions 322 section 6.3

EXAM

23-24 7.1 Intro to Exponential and Logarithmic Functions 341 section 7.1

25-26 7.2 Properties of Logarithms 360 section 7.2

27 7.3 Exponential Equations and Inequalities 371 section 7.3

28 7.4 Logarithmic Equations and Inequalities 381 section 7.4

29-30 7.5 Applications of Exponential and Log Functions 392 section 7.5

31 8.1 Systems of Linear Equations: Gaussian Elimination 413 section 8.1

32 8.2 Systems of Linear Equations: Augmented Matrices* 431 section 8.2

32 8.3 Determinants and Cramer's Rule* 442 section 8.3

33 8.4 Systems of Non-Linear Equations and Inequalities 447 section 8.4

EXAM

34 9.1 Sequences 463 section 9.1

35 9.2 Series and Summation Notation 471 section 9.2

36 9.3 Mortgages and Annuities 479 section 9.3

***** 9.4 Induction* 482 section 9.4

***** 9.5 The Binomial Theorem* 490 section 9.5

37 10.1 Complex Numbers 503 section 10.1

38 10.2 The Fundamental Theorem of Algebra 506 section 10.2