

Week-by-Week Subject Guide for Engineering Math 1311-1321

1311 Weekly Topic List

- Week 1:** 1.3,1.5, 1.6, 1.7 Functions, Compositions, Exponential Function, Logarithms, Inverse Functions, Parametric Curves
- Week 2:** 2.1-4, Velocity, Limits, Limit Laws , Continuity, Derivatives
- Week 3:** 2.5-2.7 Relationship between a Function and its Derivative.
- Week 4:** 2.8-3.3 Derivatives of Polynomials and Exponential, Product and Quotient Rules, Derivatives of Trig Functions
- Week 5:** 3.4-3.7 , Chain Rule, Implicit Differentiation, Inverse Trig Functions, Log Functions
- Week 6:** 3.8- Log Derivatives, Linear Approximation, Differentials, Applications.
- Week 7:** 4.1-4 Linear Approximation, Differentials, Related Rates, Max and Min Values, Derivatives and Shapes of Curves,
- Week 8:** 4.5-8, l'Hopital's Rule, Optimization, Newton's Method, Antiderivatives.
- Week 9:** 5.1-5.4 Areas, Distances, The Definite Integral, Evaluating Definite Integrals, Fundamental Theorem of Calculus
- Week 10:** 5.5-5.8 Substitution Rule, Integration by Parts.
- Week 11:** 5.9-10,6.1-6.2, Approximate Integration, Improper Integrals, Areas Between Curves, Volumes.
- Week 12:** 6.3-6.6 Volumes by Shells, Arc Length, Average Values, Applications of Integration to Engineering
- Week 13:** 7.1-7.4 Modeling with Differential Equations, Direction Fields, Separable Differential Equations, Exponential Growth and Decay
- Week 14:** Review, slack time
- Week 15:** Review, slack time

1321 Weekly Topic List

- Week 1:** 8.1- 8.3 Sequences, Series, Convergence Tests for Series, Estimating Sums
- Week 2:** 8.4-8.6, Power Series, Representing Functions with Power Series,
- Week 3:** 8.7-8, 9.1-9.2 Taylor and Maclaurin Series, Applications of Taylor Polynomials Three Dimensional Coordinates,
- Week 4:** 9.3-9.6 Vectors, Dot Product, Cross Product, Equations of Lines and Planes, Functions and Surfaces
- Week 5:** 10.1-10.4, Vector Functions, Space Curves, Derivatives and Integrals of Vector Functions, Arc Length, Curvature, Velocity, Acceleration
- Week 6:** 10.5 , 11.1-11.3, Parametric Surfaces, Functions of Several Variables, Limits, Partial Derivatives, Tangent Planes,
- Week 7:** 11.4-7, Linear Approximation, Chain Rule, Directional Derivative, Gradient Vector, Maximum and Minimum Values,
- Week 8:** 11.8, Lagrange Multipliers, 12.1-3, Double integrals, Iterated Integrals, Integration over general regions
- Week 9:** 12.4-7, Integrals in Polar Coordinates, Applications, Surface Area, Triple Integrals
- Week 10:** 12.7-9 , Cylindrical/Spherical Coordinate Integrals, Change of Variables, Jacobians,
- Week 11:** 13.1-3, Vector Fields, Line Integrals, Fundamental Theorem of Line Integrals
- Week 12:** 13.4-6, Green's Theorem, Curl and Divergence, Surface Integrals
- Week 13:** 13.7-8, Stokes' Theorem, Divergence Theorem, Summary
- Week 14:** Review, slack time
- Week 15:** Review, slack time