


Fundamentals of Engineering Exam - Mathematics

The following skills are recommended for students who plan to take the Fundamentals of Engineering Exam. There is a separate study plan for the Statistics section of the exam. Choose your textbook from the dropdown menu. Once you have chosen the textbook, click on the words “study plan”. Expand the Chapter + to see the individual sections. Each section has an example presented on video. (click the video icon  on the right of your screen) There are also several exercises available for practice. If you need help with an exercise, you can click on the menu to the right for help, to read the related section of the textbook, or to see additional examples.

Textbook: **Washington: Basic Technical Mathematics with Calculus, 9e**

- Chapter 0 - Orientation Questions for Students
- Chapter 9 – Vectors and Oblique Triangles
 - Sections 9.1-9.6 Components of Vectors, Applications, Law of Sines, Law of Cosines
- Chapter 12 – Complex Numbers
 - Sections 12.1-12.6 Basic Operations, Graphs, Polar Forms, Exponential Form, and Roots
- Chapter 20 – Additional Topics in Trigonometry –
 - Sections 20.1-20.6 Trig identities, Sum, Difference, Double Angle and Half Angle Formulas, Trig Equations and Inverse Trig Functions
- Chapter 21 – Plane Analytic Geometry
 - Sections 21.1 – 21.11 Conic Sections , Polar Coordinates and Curves in Polar Coordinates
- Chapter 23 – the Derivative
 - Sections 23.1- 23.9 Derivatives of Polynomials, Implicit Functions and Higher Derivatives.
- Chapter 24 – Applications of the Derivative
 - Sections 24.1-24.8 Tangents and Normals, Newton’s Method, Curve sketching, Max and Min, and Linear Approximations
- Chapter 25 – Integration
 - Sections 25.1-25.4 Indefinite and Definite Integral
- Chapter 26 – Applications of Integration
 - Sections 26.1-26.6 Areas, Volumes, Centroids, Moments of Inertia
- Chapter 27 – Differentiation of Transcendental Functions
 - Sections 27.1-27.8 Derivatives of Trig functions and Inverse Trig Functions, Applications, Derivative of Log and Exponential Functions, L’Hospital’s Rule

- Chapter 28 – Methods of Integration
Sections 28.1-28.11 Integration by Parts, Integration by Trig Substitution, Partial Fractions and Tables
- Chapter 29 – Partial and Double Integrals
Sections 29.1-29.4 Functions of Two Variables, Curves and Surfaces in Three Dimensions
- Chapter 30 – Expansion of Functions in Series
Sections 30.1-30.7 Infinite Series, McLaurin Series, Taylor Series, Fourier Series
- Chapter 31 – Differential Equations
Sections 31.1-31.12 Separation of Variables, First Order Equations, Higher Order, Applications, LaPlace Transforms

Textbook: **Thomas: Calculus Early Transcendentals Media Upgrade, 11e**

To open a new textbook: Click “My Courses”, then “Enroll in a new course”

- Chapter 16 –Integration in Vector Fields
Sec 16.1 Line Integrals
Sec 16.2 Gradients, Circulation
Sec 16.8 The Divergence Theorem

Textbook: **Adams: Calculus, 7e**

To open a new textbook: Click “My Courses”, then “Enroll in a new course”

This Text has exercises but no video instruction.

- Chapter 16 –Vector Calculus
Sec 16.1 Gradient, Divergence and Curl
Sec 16.2 Identities Involving Gradient, Divergence and Curl