

GMP V Curriculum

Textbook

Calculus: Early Transcendentals by James Stewart (UB Custom Edition)

MTH 141 – College Calculus I – Fall Semester

Catalogue Description

An introduction to the concepts of calculus including limits, derivatives, integrals, and the Fundamental Theorem of Calculus. 4 credits

Weekly Topics

Week 1

Sections 2.1–2.3: Tangent/velocity problems, limits, limit laws

Week 2

Sections 2.4–2.5: Definition of a limit, continuity

Week 3

Sections 2.6–2.7: Limits at infinity, derivatives

Week 4

Sections 2.8, 3.1a, 1.4: Derivatives of polynomials, exponentials

Week 5

Section 1.5: Inverse/log/trig functions

Week 6

Sections 3.1b, 3.2: Product/quotient rules

Week 7

Sections 3.3–3.5: Trig derivatives, chain rule, implicit differentiation

Week 8

Sections 3.6, 3.8–3.11: Log derivatives, growth/decay, related rates

Week 9

Sections 4.1–4.3: Max/min, mean value theorem

Week 10

Sections 4.4–4.5: L'Hospital's Rule, curve sketching

Week 11

Sections 4.7–4.9: Optimization, Newton’s method, antiderivatives

Week 12

Sections 5.1–5.3: Areas, definite integrals, Fundamental Theorem of Calculus

Optional Topics

Sections 5.4–5.5: Indefinite integrals, Net Change Theorem

MTH 142 – College Calculus II – Spring Semester

Catalogue Description

Differentiation and integration of transcendental functions; infinite sequences; series and power series; integration methods; additional topics in analytic geometry. 4 credits

Weekly Topics**Week 1**

Sections 6.1–6.2: Integration by parts, trigonometric integrals

Week 2

Sections 6.3–6.4: Trigonometric substitution, partial fractions

Week 3

Sections 6.5–6.6: Improper integrals, arc length

Week 4

Sections 6.7–6.8: Surface area, applications to physics

Week 5

Sections 7.1–7.2: Sequences, series

Week 6

Sections 7.3–7.4: Convergence tests, power series

Week 7

Sections 7.5–7.6: Taylor series, applications of Taylor series

Week 8

Sections 8.1–8.2: Parametric equations, polar coordinates

Week 9

Sections 8.3–8.4: Area and arc length in polar coordinates

Week 10

Sections 8.5–8.6: Conic sections, applications of conic sections

Week 11

Sections 9.1–9.2: Vectors, dot product

Week 12

Sections 9.3–9.4: Cross product, applications of vectors