**MATH 140 + MATH 14 OUTLINE
CALCULUS FOR BUSINESS with SUPPORT**
TEXT: Calculus for Business, Economics, and the Social and Life Sciences, (Brief) 11th Ed.
Authors: Hoffmann, Bradley, Sobecki, Price

*Approved: November 2018 Effective: Summer 2019*

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| **MATERIAL TO BE COVERED** | **SECTIONS FROM TEXT** | **Recommended****TIME LINE** |
| Some algebra review; Limits; One-sided limits; continuity**Math 14 Support Topics:** Solving quadratic, polynomial, rational, and radical equations; solving polynomial, rational, and absolute value inequalities; asymptotes and limits approaching infinity; graphs of basic functions; piecewise functions | 1.5 & 1.6Optional: A1, A2, 1.1 – 1.4 | Math 140:6 hoursMath 14:6 hours |
| Definition of derivative; Techniques of differentiation including product, quotient, and chain rules; Higher-order derivatives; Implicit differentiation; Related rates. (Optional: Marginal analysis)**Math 14 Support Topics:** Linear functions and slope; difference quotients; composition of functions; differentiation rules and the chain rule; applications involving cost, profit, and revenue | 2.1 – 2.4 & 2.6Optional: 2.5 | Math 140:7 hoursMath 14:4 hours |
| Increasing/decreasing functions; Relative extrema; Concavity and points of inflection; Curve sketching; Business and additional applied problems**Math 14 Support Topics:** Graphs of basic functions and transformations; polynomial and rational functions | 3.1 – 3.5 | Math 140:11.5 hoursMath 14:4 hours |
| Exponential and logarithmic functions; Differentiation of exponential and logarithmic functions and their applications**Math 14 Support Topics:** Exponential and logarithmic functions and equations | 4.1 – 4.4 | Math 140:3.5 hoursMath 14:2 hours |
| Indefinite integration; Differential equations; Integration by substitution; The definite integral and the Fundamental Theorem of Calculus; Applications of the definite integral including area between curves and average value of a function; Additional business applications (Optional: Additional applications of integration to the life and social sciences)**Math 14 Support Topics:** Summation notation and Riemann sums; applications involving average cost, average profit, and average revenue | 5.1 – 5.5Optional: 5.6 | Math 140:9.25 hoursMath 14:3 hours |
| Integration by parts; Numerical integration; Improper integration**Math 14 Support Topics:** Integration by parts; integration by substitution | 6.1 – 6.3 Optional: 6.1 Integration tables | Math 140:5 hoursMath 14:3 hours |
| Functions of several variables; Partial derivatives; Optimizing functions of two variables; The method of Lagrange multipliers; Double integrals (Optional: Least-squares regression)**Math 14 Support Topics:** Functions of several variables; the method of Lagrange multipliers; double integration | 7.1 – 7.6 Optional: 7.4 | Math 140:8 hoursMath 14:3.75 hours |

**All hours listed are face-time; i.e. breaks are administered by the instructor separately and**

**are in addition to the hours listed.**

**Math 140 (4 units): 51.5 teaching hours + 6 hours for exams + 2.5-hour final exam**

**Math 14 (2 units): 30 teaching hours. Exams in the support course are at the discretion of the professor.**

### **Math 14 is a 15-week course. The corequisite course does not meet during finals week.**

**Math 140 Note:** Professors are asked to emphasize that students use correct units when stating answers.

**Math 14 Note:** Math 14 is a Pass/No Pass course and is not subject to department grading policy.

Submitted by: Beydler (chair), Edwards, Rolle, Takashima, Tamayo, Tatoian, Wohlgezogen

Math Department Policy can be found at: <https://www.mtsac.edu/math/departmentpolicy.html>