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Calculus I

APSC-171*

The first of two half-courses in calculus, taken by all first-year Applied Science students. A 50% standing is a prerequisite for most second year mathematics courses in the Faculty of Applied Science.

Textbook: *Calculus: Early Transcendentals*, 4th Edition
by J. Stewart (Brooks/Cole)
APSC 171 Interactive Course Notes

Instructors: Jonker, Koestler, M. Cojocaru, B. Coolen

Evaluation:	Final examination	70%
	Midterm examination	15%
	Homework	10%
	Quizzes	5%

Outline:

1. Functions, mathematical models, exponential functions
2. Inverse functions, logarithmic functions, limits
3. Continuity, limits at infinity, derivatives, rules of differentiation
4. Rates of change in science, derivatives of trig functions, chain rule, implicit differentiation
5. Higher derivatives, derivatives of inverse trig functions and of logarithms
6. Differential equations in mathematical models, exponential growth and decay, related rates
7. Linear approximation and differentials, maximum and minimum values, mean value theorem, concavity
8. *l'Hopital's Rule*, curve sketching, optimization, antiderivatives
9. Definite integral
10. Fundamental theorem of calculus, substitution, logarithm defined as an integral
11. Area, volumes, work, average value of a function
12. Integration by parts, trigonometric integrals