MATH 100 - Differential Calculus with Applications to Physical Sciences and Engineering

Session 2019W Term 1, September - December 2019

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Course outline

- All sections of Math 100 cover the topics listed below.
- A "week" represents *approximately* 150 minutes of class time, not necessarily a calendar week.
- Also see the learning objectives.
- The columns below correspond to sections of different texts
  - Your primary text
    - CLP textbook and CLP problem book by Feldman, Rechnitzer and Yeager.
  - Secondary suggested texts
    - Mooculus by Fowler and Snapp
    - APEX Calculus by Hartman et al
    - Active Calculus by Boelkins, Austin and Schlicker
  - A text that was used previously for this course (you do not have to buy this, but it is a perfectly good text)
    - Stewart Calculus 7th edition (though any edition that includes single variable calculus will do)

	Topics	**CLP Text**	**Active Calculus**	**Apex Calculus**	**Mooculus**	Stewart
Week 1	Tangents and velocity Introduction to limits Using limit laws	1.1-1.4	1.1-1.2	1.1 & 1.3-1.4	1.1-1.3	2.1-2.3
Week 2	Limits at infinity Continuity A first look at derivatives	1.5-1.6 & 2.1-2.3	1.7 2.8 1.3	1.5-1.6 & 2.1-2.2	2.1-2.3 & 3.1	2.5-2.7
Week 3	A second look at derivatives Derivatives of sums, products and ratios Derivatives of exponentials	2.3-2.4 & 2.6-2.7	1.4, 2.1, 2.3	2.3-2.4	3.1-3.2 & 5.1-5.2	2.8 & 3.1-3.2
Week	Derivatives of	2.8-	2.2,2.4-	2.3-2.4	7.1 & 6.1	3.3-3.4

4	trig functions The chain rule Inverse functions	2.9 & 0.6	2.6	2.5 ◯	& 0.2	& 1.6
Week 5	Logarithms (and their derivatives) Implicit differentiation Inverse trig functions	2.10-2.12	2.6-2.7	2.6-2.7	6.2-6.3 & 7.2	3.5-3.6
Week 6	Rates of change Exponential growth and decay	3.1 3.3	◯	◯	8.2 & 11.2	3.7-3.8
Week 7	Related rates Linear approximations Taylor polynomials	3.2 3.4	3.5 1.8 8.5	4.2 4.4 8.7	8.3 & 10.1 no Taylor	3.9-3.10 no Taylor
Week 8	Taylor's formula and remainders Finding maxima and minima	3.4 3.5	8.5 3.3	8.7 3.1	no Taylor 4.1 & 9.1	no Taylor 4.1
Week 9	Mean value theorem Curve sketching	2.13 3.6	no MVT 3.2	3.2, 3.3-3.5	10.3 & 4.1	4.2-4.3 & 4.5
Week 10	More curve sketching	3.6	3.2	3.3-3.5	4.2-4.5	4.3 & 4.5
Week 11	Optimisation problems L'Hopital's rule	3.5 3.7	3.4 & 2.8	4.3 ◯	9.2 & 8.1	4.4 & 4.7
Week 12	Antiderivatives Review (if time)	4.1	4.4	◯	11.1	4.9