

**Mathematics 335 / 355**

**Analysis I / Honours Analysis I**

(see Section 3.5C of Faculty of Science [www.ucalgary.ca/pubs/calendar/current/sc-3-5.html](http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)  
and Course Descriptions: <http://www.ucalgary.ca/pubs/calendar/current/course-main.html>)

*Syllabus*

<u>Topics</u>	<u>Number of hours</u>
Sets and functions; proof by induction, contradiction and contrapositive	3
Axioms for integers and rational numbers; countability of the rationals	3
Axioms for the real numbers; supremum, infimum and completeness; uncountability of the reals	3
Sequences and convergence; examples of epsilon-delta arguments	3
Cauchy sequences, Bolzano-Weierstrass theorem, convergence of bounded, monotone sequences	3
Infinite series and the sequence of partial sums; absolute convergence and rearrangements	3
Limits of functions; more examples of epsilon-delta arguments; properties of limits; infinite limits	3
Continuous functions; continuous functions on compact intervals	3
Uniform continuity of continuous functions on compact intervals; approximation of continuous functions	3
The derivative and differentiability; differentiation rules	3
Rolle's theorem and the mean value theorem; applications; Taylor's theorem	3
The Riemann integral; integrability of monotone and continuous functions	3
The fundamental theorems of calculus; substitution and integration by parts	3
<b>TOTAL HOURS</b>	<b>39</b>

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