UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
**Department of Mathematics and Statistics**

# PURE MATHEMATICS 545
# "ANALYSIS III"

**Calendar Description:** H(3-1T)

Metric spaces and function spaces; equi-continuity; trigonometric series and Fourier series; elements of Lebesgue integration.

**Prerequisite**: Pure Mathematics 445 or consent of the Division.

**Possible Texts:**

K. Stromberg, *An Introduction to Classical Real Analysis*, Wadsworth, 1981.
W. Rudin, *Principles of Mathematical Analysis*, 3ed, McGraw-Hill, 1976.

## *Syllabus*

| **Topics** | **Number of Hours** |
|---|---|
| Metric spaces, function spaces, Stone-Weierstrass theorem, equi-continuity, Arzela-Ascoli theorem. | 6 |
| Trigonometric series and Fourier series: Riemann-Lebesgue lemma, Riesz-Fischer theorem, Parseval's identities, summability. | 9 |
| Lebesgue integral: measure and integral in Euclidean spaces, monotone convergence theorem, dominated convergence theorem, Lp spaces, Fubini's theorem, change of variables, comparison with the Riemann integral. | 12 |
| Suggested Optional Topics:<br>- Expansion on any of the above topics<br>- Construction of the real numbers<br>- Calculus on normed spaces and Banach spaces<br>- Advanced topics on infinite series and products<br>- Differential forms. | 9 |
| **TOTAL HOURS** | **36** |

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97.02.06 Effective Fall 1997
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