

# COLLOQUIUM

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## On the Golden Ratio, Strong Law, and First Passage Problem

The logo for Mathematics and Statistics features a central orange circle with the text "Mathematics and Statistics" in black. This circle is set against a background of four blue squares arranged in a 2x2 grid, with the circle overlapping the center of the squares.

**Mathematics  
and  
Statistics**

Date: Friday November 27, 2020

Time: 3:30 - 4:30 PM

Zoom link:

<https://uregina-ca.zoom.us/j/92508741353?pwd=UzFOMjVMelVhRWhqR215cjd6dTICQT09>

**Abstract:** For a sequence of correlated square integrable random variables  $\{X_n, n \geq 1\}$ , conditions are provided for the strong law of large numbers

$$\lim_{n \rightarrow \infty} \frac{S_n - ES_n}{n} = 0$$

almost surely to hold, where  $S_n = \sum_{i=1}^n X_i$ . The hypotheses stipulate that two series converge, the terms of which involve, respectively, both the Golden Ratio  $\varphi = \frac{1+\sqrt{5}}{2}$  and bounds on  $\text{Var } X_n$  (respectively, bounds on  $\text{Cov}(X_n, X_{n+m})$ ). An application to first passage times is provided.