

# Stat31120 Syllabus

## September

27 **Lec0:** Introductions

29 **Lec1:** Random Variables and Convergence

## October

4/6 **Lec2:** Stochastic Process, BM

11 **Lec3:** Ito and Stratonovich Integral

13/18 **Lec4:** Solvable SDE

20 **Lec5:** Strong and Weak Solution of SDE

25 **Lec5/6:** Euler method, Strong Convergence

27 **Lec6/7:** Numerical Stability

## November

1 **Mid Term**

3 **Lec8:** Ito Taylor Expansion: Multiple Stochastic Integrals

8 **Lec9:** Ito Taylor Expansion: General Form

10 **Lec10:** Strong Approximation of Stochastic Integrals

15 **Lec11/12:** Strong Schemes with higher order

17 **Lec13:** General Strong Convergence Theorem, Stochastic RK Schemes

29 **Lec14:** Implicit Strong Schemes

## December

1 **Lec15/16:** Weak Schemes

## **Learning outcomes are evaluated by**

1. Implement schemes by PC programs
2. Estimate convergence order
3. Apply Feynman-Kac formula to solve PDE by SDE