# MSG800/MVE170 Basic Stochastic Processes Fall 2014

# Exercise Session 2

## Chapter 5 in Hsu's book

**Solved problems.** Problems 5.10, 5.13, 5.21, 5.22, 5.23, 5.26, 5.30 and 5.36 in Hsu's book.

**Supplementary problems** for own work. Problems 5.83, 5.84, 5.85, 5.86 and 5.89 in Hsu's book.

**Computer problem** for own work. Consider a time homogeneous Markov chain $\{X_n\}_{n=0}^{\infty}$ with state space $E$, initial distribution $\mathbf{p}(0)$ and transition probability matrix $P$ given by

$$E = \{0, 1, 2\}, \quad \mathbf{p}(0) = [1 \ 0 \ 0] \quad \text{and} \quad P = \begin{bmatrix} 1/2 & 1/3 & 1/6 \\ 0 & 2/3 & 1/3 \\ 0 & 0 & 1 \end{bmatrix},$$

respectively. Find by means of computer simulations an as good as is possible for you approximation of the expected value $E(T)$ of the time $T = \min\{n \in \mathbb{N} : X_n = 2\}$ it takes the chain to reach the state 2.