4.8 Learning objectives

By the end of this chapter, you should be able to:

- explain why not using a conjugate prior generally causes problems in determining the posterior distribution

- describe the Gibbs sampler, explain why it is a Markov chain and give an outline as to why its stationary distribution is the posterior distribution

- describe the issues of processing MCMC output (burn-in, autocorrelation, thinning etc.) and interpret numerical/graphical output

- derive the full conditional densities for any posterior distribution and name these distributions if they are "standard" distributions given in the notes or on the exam paper

- describe a Metropolis-Hastings algorithm in general terms and when using either symmetric or non-symmetric random walk proposals or independence proposals

- describe the hybrid methods *componentwise transitions* and *Metropolis within Gibbs*

- provide a detailed description of **any** of the MCMC algorithms as they apply to generating realisations from **any** posterior distribution