List of Figures

1.1 Histograms and kernel density estimates of Monte Carlo approximations to the gamma(68,45) distribution, with true density in gray. ................................................. 20
1.2 Results from the Metropolis algorithm for the normal model. .......................... 24
1.3 Plot of Markov chain in $\beta_3$ along with autocorrelation function. ................. 26

2.1 Posterior and prior distributions of mean birth rates. ................................. 35
2.2 Beta posterior distributions under two different sample sizes and under two prior distributions .............................................. 38
2.3 Posterior and prior distributions of binomial sampling model by simulating 1000 samples. .................................................. 39

3.1 Prior and conditional posterior distributions for the population mean wing length. ................................................................. 44
3.2 Graphical representation from Monte Carlo simulation. ............................... 45
3.3 Graphical representation from Gibbs sampler. ........................................... 46

4.1 Scatter plot of wormyFruits ................................................................. 51
4.2 Trace and density plots of wormyFruits data ........................................ 52
4.3 Density plots of Poisson regression model .............................................. 57
4.4 Trace and marginal posterior density plots of logistic regression model .......... 61
4.5 Trace and marginal posterior density plots of probit model. ........................ 63
4.6 Trace and marginal posterior density plots of complementary log-log model. .......................................................... 66

5.1 plot of death rates against log exposure for all hospitals .............................. 71
5.2 Histogram of simulated draws from the posterior predictive distribution of $y_{901}$ ................................................................. 72