

37457

# Advanced Bayesian Methods

Professor Matt Wand

University of Technology Sydney

## Main Topics

- Topic 1 Probabilistic Graph Theory
- Topic 2 Bayesian Statistical Inference
- Topic 3 Bayesian Inference Engines
- Topic 4 Advanced Bayesian Statistical  
Models and Analyses

## Agenda for Today's Class

FIRST HOUR: WRAP UP...

Topic 1 Probabilistic Graph Theory

SECOND HOUR: START ON...

Topic 2 Bayesian Statistical Inference

Need to finish one item held over from Class 3.

## Major Goal for this Subject

By Week 6, tool you up to be able to do

**ANY\***

data analysis, no matter how complex,

– and **UNDERSTAND THE UNDERLYING MATHS.**

**CENTRAL CONCEPT: DETERMINATION OF FULL CONDITIONAL DISTRIBUTIONS → THIS HOUR'S FOCUS!**

This Hour: Toy Examples on Underlying Maths

Hand-out hand-written sheet re Assignment 1.

## Continuous Random Variable Jessica the DAG

$$x_1 \sim N(3, \frac{1}{4}), \quad x_3 \sim \text{Gamma}(6, 1).$$

$$x_2|x_1, x_3 \sim N(47 - 11x_1, 1/(2x_3)).$$

**WANTED**

1.  $p(x_1|x_2, x_3)$
2.  $p(x_3|x_1, x_2)$

**KNOWN AS THE FULL CONDITIONALS**