

# Statistical Modelling - Module I

## *Graphical models*

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This course introduces the basics of graphical modelling and covers methodological, computational and applied aspects. During the course, both frequentist and Bayesian methodologies will be presented.

Program:

- ✓ Introduction:  
graph theory; undirected graphs; directed acyclic graphs; Markov properties and Markov equivalence of DAGs.
- ✓ Probabilistic graphical models: Gaussian graphical models; categorical graphical models.
- ✓ Frequentist approaches to graphical model selection:  
graphical lasso; PC algorithm.
- ✓ Bayesian graphical modelling:  
principles of Bayesian inference and model selection; parameter prior distributions for undirected and directed graphical models; Markov chain Monte Carlo methods.
- ✓ Causal inference using directed acyclic graphs

## References

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- MAATHUIS, M. & NANDY, P. (2016). A review of some recent advances in causal inference. In P. Bühlmann, P. Drineas, M. Kane & M. van der Laan, eds., *Handbook of Big Data*. Chapman and Hall/CRC, 387–408.
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