

## Causal Inference

Topic	No. of Sessions
<b>Introduction</b>	1
<b>Probabilistic Graphical Models</b>	
• Bayesian networks	1
• d-separation, I-map	2
<b>Causal Bayesian Networks, Functional Models</b>	
• Interventions, Total causal effect	1
• Counterfactuals	1
<b>Learning Causal Structures</b>	
• Observational setting	
○ Constraint-based methods (IC, PC)	2
○ Score-based methods (GES)	1
○ Learning in the presence of latent confounders (IC*, FCI)	2
• Interventional setting	
○ Types of interventions, Budgeted experiment design	2
• Multi-environment setting	2
• Learning based on linear assumptions (LiNGAM)	2
• Learning based on instrumental variables	2
• Learning from time-series	
○ Granger causality analysis	1
○ Statistical dependency measures, Directed information	2
<b>Causal Inference</b>	
• Back-door criterion, Front-door criterion	2
• Do-calculus	2
• Sampling selection bias, Transportability	2
• Mediation analysis	2

### References:

[1] Jonas Peters, Dominik Janzing, and Bernhard Schölkopf. *Elements of Causal Inference: Foundations and Learning Algorithms*. MIT press, 2018.

[2] Judea Pearl, Madelyn Glymour, and Nicholas P. Jewell. *Causal inference in statistics: a primer*. John Wiley & Sons, 2016.

[3] Judea Pearl. *Causality*. Cambridge university press, 2009.

[4] Peter Spirtes, Clark N. Glymour, and Richard Scheines. *Causation, prediction, and search*. MIT press, 2000.