



MMPH6106 Advanced Epidemiological Methods I

Course Coordinator:	Dr Jane Zhao
Course Description:	The overarching conceptual framework for this course centres on the use of structural causal models to design, analyze and interpret study design commonly used in epidemiology, including observational, instrumental variable, quasi-experimental and experimental study designs. This course will consider how structural causal models, mediation analysis, effect modification, , sensitivity analysis and consideration of missing data, can be applied to the pursuit of making valid and transportable causal inferences in epidemiology.
Venue:	TBC

Prerequisite: CMED6200 Introduction to epidemiology
CMED6300 Intermediate epidemiology

Term 2 (Thursday) Contact person: Ms. Huang Xin/ Ms. Zhang Junmeng

Date	Time	Lecture Topic	Lecturer	Venue
11 Jan 2024	6:30-9:30 pm	1. Causation and causal inference	Dr Jane Zhao	TBC
18 Jan 2024	6:30-9:30 pm	2. Structural causal models and its application to study design	Dr Jane Zhao	TBC
25 Jan 2024	6:30-9:30 pm	3. Identifying confounders	Dr Jane Zhao	TBC
01 Feb 2024	6:30-9:30 pm	4. Effect measurement modification	Dr Jane Zhao	TBC
22 Feb 2024	6:30-9:30 pm	5. Mediation	Dr Jane Zhao	TBC
29 Feb 2024	6:30-9:30 pm	6. Misclassification	Dr Jane Zhao	TBC
07 Mar 2024	6:30-9:30 pm	7. Instrumental variable analysis	Dr Jane Zhao	TBC
14 Mar 2024	6:30-9:30 pm	8. Missing data	Dr Jane Zhao	TBC
21 Mar 2024	6:30-9:30 pm	9. Alternative epidemiologic study designs and triangulation of evidence in causal inference	Dr Jane Zhao	TBC
28 Mar 2024	6:30-9:30 pm	10. Special topics in epidemiology	Dr Jane Zhao	TBC
11 Apr 2024	6:30-8:30 pm	Final examination	-	TBC

Course Assessment: Written assignments: 30%
Participation: 20%
Examination: 50%

Recommended Textbooks: 1. Szklo M, Nieto FJ. *Epidemiology: Beyond the Basics*. 3rd ed. Sudbury, MA: Jones and Bartlett Publishers, LLC; 2014.



2. Rothman KJ, Greenland S, Lash TL. *Modern Epidemiology*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
3. Pearl J. *Causality. Models, Reasoning, and Inference*. 2nd edition. New York: Cambridge University Press, 2009. (Optional reading)
4. Burgess S and Thompson SG. *Mendelian randomization: Methods for Using Genetic Variants in Causal Estimation*. Boca Raton: CRC Press, Taylor & Francis Group, LLC, 2015 (Optional reading)

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