

## The NUS MBA Course Outline

**Course Code** : BMA5275  
**Course Title** : Analytics in Managerial Economics  
**Department** : ANALYTICS & OPERATIONS  
**Specialisation/s** : SNO/ ANO/ DGB

### Overview

We analyze price formation and economic performance in competitive and monopolist markets by using optimization, statistical and stochastic methods. Microeconomic techniques are used to analyze various pricing decisions and problems such as price discrimination and price elasticity estimation. We also discuss causal inference by using instrumental variables and difference-in-differences design. Finally, we briefly discuss multi-armed bandits and their algorithms. This course also introduces Python to students.

### Course Objectives

To give students an understanding of causal inference and associated techniques. Apply techniques to make causal inferences. Perform first-, second-, and third-degree price discrimination given the demand curve. Implement basic multi-armed bandit algorithms. Be able to read and write Python code.

### Assessment (Subject to change)

Assessment Components	Weightage
One in-class project	40%
One group project	40%
One group homework	20%
Exceptional Participation gives up to 5% to the final grading.	
<b>Total</b>	<b>100%</b>

### Schedule and Outline (Subject to change)

Lesson/ Week	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1 & 2	Introduction, prediction vs causation; Introduction to Python
3 & 4	Perfect competition and monopoly; Third, First, and Second-degree price discrimination, Guest lecture (Tentative)
5 & 6	Linear regression, interaction variables
7 & 8	Endogeneity, Instrumental variables, two stage least squares
9 & 10	Randomized controlled trials, Difference in differences
11 & 12	Multi-armed Bandits, In-class project
13	Recap

**General Guide & Reading** (e.g. Case preparation guide, project report guide, main textbook & supplementary materials, etc)

- Angrist, Joshua D., and Jörn-Steffen Pischke. Mostly harmless econometrics: An empiricist's companion. Princeton university press, 2008.
- Jeffrey M. Wooldridge: Introductory Econometrics, A Modern Approach, 5th Edition
- Gelman, Andrew, Jennifer Hill, and Aki Vehtari. Regression and other stories. Cambridge University Press, 2020.
- Lynne Pepall, Dan Richards and George Norman: Industrial Organization: Contemporary Theory and Empirical Applications, 5th Edition, Wiley
- Hal R. Varian: Intermediate Microeconomics, 8th Edition
- Daron Acemoglu, David Laibson and John List: Microeconomics, 2<sup>nd</sup> Edition, Pearson
- Slivkins, Aleksanders: "Introduction to multi-armed bandits," 2021, available at <https://arxiv.org/abs/1904.07272>

### **Academic Honesty & Plagiarism**

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubts, you should consult your instructor.

### **Additional guidance is available at:**

- [Administrative Policies](#)
- <http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct>
- <http://nus.edu.sg/osa/resources/code-of-student-conduct>