

Course Title:	Data Analytic and Strategic Management
Course Code:	PMS4102
Recommended Study Year:	2
No. of Credits/Term:	3
Mode of Tuition:	Lecture & Tutorial
Class Contact Hours:	3 hours per week
Discipline:	Interdisciplinary
Prerequisite(s)	N/A
Co-requisite(s)	N/A
Exclusion(s)	N/A
Exemption requirement(s)	N/A

Course Overview:

“Big Data” is revolutionizing our lifestyles. Data analytic techniques have offered tremendous opportunities for public management practitioners. What is “Big Data”? How does Big Data analytics work? What are the challenges and opportunities inherent in Big Data analytic? As public management practitioners, how to balance the various interests involved to develop responsible solutions? This course introduces key concepts and tools in Big Data analysis and provides an overview of Big Data applications in various contexts of the society such as business, politics, media, education and medical care. It also discusses in depth associated privacy, fairness, transparency and accountability issues.

Teaching Methods:

This course consists of lectures, classroom discussions, tutorials, presentations, and research and writing.

Aims:

- Introduce the conceptual and theoretical dimensions of Big Data;
- Evaluate how Big Data analytics is changing various facets of society;
- Analyse the ethical, legal and social issues of Big Data.

Learning Outcomes:

By the end of the course, the aim is that students will have improved the ability to:

- Identify the strengths and weaknesses of various Big Data approaches;
- Recognize the challenges and opportunities of Big Data applications;
- Develop thoughtful responses to ethical, legal and social concerns about Big Data.

Assessment of Learning Outcomes:

- **Attendance and Participation (10%):** Students are expected to complete all required readings prior to each lecture and to attend all lectures and tutorial sessions. To secure a good participation grade, students are encouraged to actively contribute to the conversations during tutorial sessions.
- **Tutorial Presentation (10%):** Each student will sign up for one of “tutorial sessions” during the course. Two (up to three) students will work as a team to make a short presentation and lead discussion in each week’s tutorial session.
- **Case Study Report (30%):** In a team of two students, you will write a 10-page report (Times New Roman, 12-point font, double spaced) to analyse one big data application and discuss potential ethical, legal and social issues. Further details of expectations will be given during the course. This assignment will be due on **Tuesday, May 1 at noon.**

- **Final Exam (50%):** The final will cover all the course material. The format is a combination of short answer questions (IDs) and longer essay questions.

Course Materials:

There are no required books for this course. All readings will be made available in electronic form through Moodle.

Important Notes:

1. Students are expected to spend a total of 9 hours (i.e. 3 hours of class contact and 6 hours of personal study) per week to achieve the course learning outcomes.
2. Students shall be aware of the University regulations about dishonest practice in course work, tests and examinations, and the possible consequences as stipulated in the Regulations Governing University Examinations and Course Work. In particular, plagiarism, being a kind of dishonest practice, is “the presentation of another person’s work without proper acknowledgement of the source, including exact phrases, or summarised ideas, or even footnotes/citations, whether protected by copyright or not, as the student’s own work.” Students are required to strictly follow university regulations governing academic integrity and honesty.
3. Students are required to submit writing assignment(s) using Turnitin.
4. To enhance students’ understanding of plagiarism, a mini-course “Online Tutorial on Plagiarism Awareness” is available on <https://pla.ln.edu.hk/>.
5. Students must adhere to the University’s guidelines and practices when using Generative Artificial Intelligence (AI) tools. The official documents “Guidelines for Using GAI Tools at Lingnan University” and “Best Practices for Ethical and Responsible Use of GAI Tools in Course Assessments” can be found here: <https://www.ln.edu.hk/tlc/generative-artificial-intelligence/gai-guidelines-best-practices>.

Course Schedule and Reading List

Lecture 1: Introduction: What is Big Data?

“Big Data Revolution,” PBS Documentary (November 19, 2016)

Recommended:

- Viktor Mayer-Schönberger and Kenneth Cukier, *Big Data: A Revolution That Will Transform How We Live, Work, and Think* (Eamon Dolan/Mariner Books, 2014).
 - Chapter 5
- danah boyd and Kate Crawford, “Critical Questions for Big Data: Provocations for a Cultural, Technological and Scholarly Phenomenon,” *Information, Communication and Society* 15, (5) 2012: 662-79.
- Hamid Ekbil et al., “Big Data, Bigger Dilemmas: A Critical Review,” *Journal of the Association for Information Science and Technology* 66, (8) 2015: 1523-45

Lecture 2: The Collection and Analysis of Big Data

- Jennifer Golbeck, “How to Teach Yourself About Algorithms,” *Slate* (February 9, 2016)
- Jacob Brogan, “What’s the Deal With Algorithms,” *Slate* (February 2, 2016)

Recommended:

- Bernard Marr, “Big Data: 33 Brilliant and Free Data Sources for 2016,” *Forbes* (February 12, 2016)
- Brian Naylor, “Firms Are Buying, Sharing Your Online Info. What Can You Do About It?” *NPR* (July 11, 2016)
- Jeff Hawkins and Donna Dubinsky, “What is Machine Intelligence vs. Machine Learning vs. Deep Learning vs. Artificial Intelligence,” *KD Nuggets* (January 2016)

Lecture 3: The Promise and the Peril of Big Data

- Cornelia L. Hammer, Diane C. Kostroch, Gabriel Quirós, and STA Internal Group, “Big Data: Potential, Challenges, and Statistical Implications,” *IMF Staff Discussion Notes* (September 13, 2017) • Read pages 10-25

Recommended:

- David Lazer, Ryan Kennedy, Gary King, and Alessandro Vespignani, “The Parable of Google Flu: Traps in Big Data Analysis,” *Science* 343, (6176) 2014 : 1203-1205.
- Madeleine Clare Elish, “[Algorithms Can Make Good Co-Workers](#),” *Slate* (February 22, 2016)
- Taylor Owen, “The Violence of Algorithms: Why Big Data is Only as Smart as Those Who Generate It,” *Foreign Affairs* (May 25, 2015)

Lecture 4: Data Analytic and Business

- Charles Duhigg, “[How Companies Learn Your Secrets](#),” *The New York Times Magazine* (February 16, 2012)

Recommended:

- Johan Bollen, Huina Mao, and Xiao-Jun Zeng, “Twitter Mood Predicts the Stock Market,” *Journal of Computational Science* 2, (1) 2006: 1-8
- Lisa Morgan, “[Big Data: 6 Real-Life Business Cases](#),” *Information Week* (August 30, 2016)
- Bernard Marr, “[The 18 Best Analytic Tools Every Business Manager Should Know](#),” *Forbes* (February 4, 2016)

Lecture 5: Data Analytic and Politics

- Harry Davies, “[Ted Cruz Using Firm that Harvested Data on Millions of Unwitting Facebook Users](#),” *The Guardian* (December 11, 2015)
- Mattathias Schwartz, “[Facebook Failed to Protect 30 Million Users From Having Their Data Harvested by Trump Campaign Affiliate](#),” *The Intercept* (March 31, 2017)
- Matthew Rosenberg, Nicholas Confessore and Carole Cadwalladr, “[How Trump Consultants Exploited the Facebook Data of Millions](#),” *The New York Times* (March 17, 2018)

Recommended:

- Gilad Lotan, Erhardt Graeff, Mike Ananny, Devin Gaffney, Ian Pearce and danah boyd, “The Revolutions Were Tweeted: Information Flows During the 2011 Tunisian and Egyptian Revolutions,” *International Journal of Communication* 5, 2011: 1375-1405
- Eitan Hersh, *Hacking the Electorate: How Campaigns Perceive Voters* (Cambridge University Press, 2015).
- Gary King, Jennifer Pan, and Margaret Roberts, “How Censorship in China Allows Government Criticism but Silences Collective Expression,” *American Political Science Review* 107, (2) 2013:1-18

Lecture 6: Data Analytic and Media

- Matt Carlson, “The Robotic Reporter Automated Journalism and the Redefinition of Labor, Compositional Forms, and Journalistic Authority,” *Digital Journalism* 3, (3) 2015: 416-431

Recommended:

- Philip Napoli, “Automated Media: An Institutional Theory Perspective on Algorithmic Media Production and Consumption,” *Communication Theory* 24, (3) 2014: 340-360

Ravi Somaiya, [“How Facebook Is Changing the Way Its Users Consume Journalism,”](#) *The New York Times* (October 26, 2014)

- Mathew Ingram, [“Twitter VS. Facebook as a News Source: Ferguson Shows the Downsides of an Algorithmic Filter,”](#) *GigaOM* (August 18, 2014)

Lecture 7: Data Analytic and Education

- Elana Zeide, [“19 Times Data Analysis Empowered Students and Schools: Which Students Succeed and Why,”](#) *Future of Privacy Forum* (March 16, 2016)

Recommended:

- Jeffrey Young, [“This Chart Shows the Promise and Limits of ‘Learning Analytics’,”](#) *The Chronicle of Higher Education* (January 4, 2016)
- Goldie Blumenstyk, [“As Big Data Comes to College, Officials Wrestle to Set New Ethical Norms,”](#) *The Chronicle of Higher Education* (June 28, 2016)
- Bridget Burns, [“Big Data’s Coming Of Age In Higher Education,”](#) *Forbes* (January 29, 2016)

Lecture 8: Data Analytic and Healthcare

- Mona Lebiad, [“9 Examples of Big Data Analytics in Healthcare That Can Save People,”](#) *Datapine.com* (May 24, 2017)

Recommended:

- Wullianallur Raghupathi and Viju Raghupathi, [“Big Data Analytics in Healthcare: Promise and Potential,”](#) *Health Information Science and Systems* 2, 2014. doi: 10.1186/2047-2501-2-3
- Adam Tanner, [“How Data Brokers Make Money Off Your Medical Records,”](#) *Scientific American* (February 1, 2016)
- Charles Choi, [“Computer Diagnoses Cataracts As Well As Eye Doctors Can,”](#) *Live Science* (January 31, 2017)

Lecture 9: Privacy in a Big Data World

- Neil Richards and Jonathan King, [“Big Data and the Future For Privacy”](#) in F. Xavier Olleros and Majlinda Zhegu, eds., *Handbook of Research on Digital Transformations* (Edward Edgar, 2016): pp.272-290

Recommended:

- Alessandro Acquisti, Laura Brandimartel and George Loewenstein, [“Privacy and Human Behavior in the Age of Information,”](#) *Science* 347: (6221) 2015: 509-514
- Michal Kosinski, David Stillwell and Thore Graepel, [“Private Traits and Attributes are Predictable from Digital Records of Human Behavior,”](#) *Proceedings of the National Academy of Sciences* 110: (15) 2013: 5802-5805
- Kate Crawford and Jason Schultz, [“Big Data and Due Process: Toward a Framework to Redress Predictive Privacy Harms,”](#) *Boston College Law Review* 55: (1) 2014: 93-128

Lecture 10: Fairness in a Big Data World

- Solon Barocas and Andrew Selbst, [“Big Data’s Disparate Impact,”](#) *California Law Review* 104, 2016: 671-732. (read pages 671-693)

Recommended:

- Jonas Lerman, [“Big Data and Its Exclusions,”](#) *Stanford Law Review* 66, 2013: 55-63.
- Ryan Calo, [“Digital Market Manipulation,”](#) *George Washington Law Review* 82, (4) 2014: 995-1051.
- Kate Crawford, [“The Hidden Biases in Big Data,”](#) *Harvard Business Review*, 2013

Lecture 11: Transparency and Accountability in a Big Data World

- Jenna Burrell, “How the Machine ‘Thinks’: Understanding Opacity in Machine Learning Algorithms,” *Big Data & Society* 3, (1) 2016: 1-12.
- Nicholas Diakopoulos, “Accountability in Algorithmic Decision Making,” *Communications of the ACM* 59, (2) 2016: 56-62.

Recommended:

- Mike Ananny and Kate Crawford, “Seeing Without Knowing: Limitations of the Transparency Ideal and Its Application to Algorithmic Accountability,” *New Media & Society* 20, (3) 2018: 973-989 • Karen EC Levy and David Merritt Johns, “When Open Data is a Trojan Horse: The Weaponization of Transparency in Science and Governance,” *Big Data & Society* 3, (1) 2016: 1-12
- Hanna Wallach, “[Big Data, Machine Learning and the Social Sciences: Fairness, Accountability and Transparency](#),” *Medium* (December 19, 2014)

Lecture 12: The Governance of Big Data

- Jacob Metcalf, Emily F. Keller and danah boyd, “[Perspectives on Big Data, Ethics, and Society](#),” *Council for Big Data, Ethics, and Society* (May 23, 2016)

Recommended:

- “[Big Data: A Tool for Inclusion or Exclusion?](#)” *Federal Trade Commission Report* (January 2016)
- Nicholas Diakopoulos, “[How to Hold Governments Accountable for the Algorithms They Use](#),” *Slate* (February 11, 2016)
- Julia Angwin, “[Make Algorithms Accountable](#),” *The New York Times* (August 1, 2016)

Lecture 13: Course Wrap-Up and Review