Module code	DSB705	**Level**	7
Module title	**Machine Learning and AI for Business**	**Credit value**	20
Programme(s) on which the module is taught	MSc Data Science in Business	**ECTS Credits**	10
		Notional learning hours	200

1. Pre-requisite modules

None.

2. Module aims and objectives

Artificial Intelligence (AI), which may have sounded like a clarion call from a dystopian sci-fi society a few years ago, has permeated into our everyday lives to seamlessly enhance various business processes, such as communication, hiring, manufacturing and planning. Though AI is still in its nascent stage it is already driving significant change across different industries to achieve the previously impossible. Machines can, for example, amplify our cognitive strengths, enhance the amount of data we can process, and cut down the time required to conduct higher-level tasks to an unimaginable level. Businesses can benefit from machine-to-machine learning applications and deep learning in formulating predictive models and personalising the customer journey. We are on the cusp of colossal changes and AI will soon be embraced in most business models and pave the way for digital transformation and disruptive innovation.

As part of your learning journey, you will be exposed to the theoretical foundations and the practical applications of AI, Machine Learning (ML) and Deep Learning (DL). This module will thus equip you with the tools and knowledge to become part of the change, helping steer it in the right direction. As future experts, you will be the future leaders who will best understand AI and its potential for businesses.

3. Learning outcomes

Upon successful completion of this module, you will be able to:

LO 1: Understand and critically reflect on the role of the analyst based on a systematic understanding and knowledge of data and analytics.
LO 2: Analyse and critically evaluate complex situations to solve problems, using data.
LO 5: Apply creative and relevant methods, production skills and technical competencies, understanding the processes at the forefront of practice.
LO 6: Apply effective interpersonal communication skills in a range of complex and specific contexts.
LO 8: Manage working and delivering as part of a team for successful outcomes.
LO 9: Negotiate the ethical, legal and regulatory dimensions of data analysis, to deliver sustainable outcomes.

4. What you will do on the module

This module will offer you an in-depth understanding of AI, Machine Learning and Deep Learning, and its applications, benefits, and limitations. As such, you will learn how to define AI, machine learning and deep learning, and how they apply to applications and business scenarios such as hyper personalisation, predictive analytics, autonomous systems, and conversation and human interaction.

You will understand the machine learning process and how machine learning algorithms work to analyse big data for business application and learn how AI is linked to other emerging technologies in developing Smart Cities. The module will cover real time data analysis with AI powered tools and the use of AI in feedback analysis. Additionally, you will learn the benefits and limitations around AI implementation and review the ethical factors that should be considered in order to implement the technologies responsibly.

Through this learning process, you will learn how to critically appraise these technologies and be effective problem-solvers. You will have the opportunity to research and apply your findings in class, suing your acquired knowledge to assess and evaluate. Moreover, this module will push you to innovate and be creative, learning the potential of AI, ML, and DL to disrupt and transform.

5. Learning and teaching methods

This module employs a flipped learning approach whereby the group learning space is transformed into a dynamic, interactive learning environment which engages students through discussion and a hands-on experience. You will be constantly challenged to think outside the box and to address real world problems drawn from contemporary developments, applying theoretical principles to make sense of issues and find solutions for them as you would in any real business scenario. You will need to make connections across disciplines and reconcile competing interests, values and perspectives. Instruction will be learner-centred and you will be actively engaged in the knowledge construction. Activities include (but are not limited to) debates and discussions, workshops, quizzes, case studies, hands-on experience with AI tools, and seminars.

The notional learning hours for this module are:

20 credit module – 200 learning hours	
Directed learning	**44 hours**
Workshops / Classes	44
Collaborative Learning	**10 hours**
Tutorials (1:1 and group) and asynchronous interaction	10
Self-directed learning	**146 hours**
Self-Directed learning (pre & post class)	73

Preparation for assessment, response to feedback and summative assessment	73
Total	**200 hours**

6. Assessment and relative weightings

You will have two summative assessments, both of which have a formative component.

Summative Assessment 1: Group work and 1000-word report (+/- 10%) (40% TMM) Develop a chatbot for one of the following areas:
Retail, Health, Automobile, Public Services, Education, Government.
In groups test the chatbot and evaluate its functionality and purpose. Prepare a 1000-word report critically assessing the effectiveness and the relevance of the virtual assistant.

Formative Assessment 1
Your group will have the opportunity to present the chatbot to your tutor and get feedback whilst in its development stage, prior to finalising it. In addition, you will be able to submit a draft copy or outline of your report for critique and feedback.

Summative Assessment 2: Individual work – Report, 3000 words (+/- 10%) (60% TMM)
Choosing one of the sectors in the group work, write a 3000-word report evaluating how AI could be implemented in a representative business in that sector in its future efforts to improve the customer journey.

Formative Assessment 2
You will have the opportunity to submit a draft copy or outline of your individual work for critique and feedback, thus ensuring it conforms to marking criteria.

7. Mapping of assessment tasks for the module

Assessment tasks	Programme Learning Outcomes								
	1	2	3	4	5	6	7	8	9
Assessment 1: Group work and report	x		n/a	n/a	x	x	n/a	x	x
Assessment 2: Individual work – Report	x	x	n/a	n/a	x		n/a		x

8. Key reading

Core textbooks:

Kapoor, A., 2020. *Marketing in the Digital World*. Business Expert Press.

King, K., 2019. *Using Artificial Intelligence in Marketing: How to harness AI and maintain the competitive edge*. Kogan Page Publishers.

Additional reading:

Boddington, P. (2017) *Towards a Code of Ethics for Artificial Intelligence*. New York: Springer.

Eidenmueller, Horst G. M., The Rise of Robots and the Law of Humans (March 26, 2017). *Oxford Legal Studies Research Paper* No. 27/2017. Available at http://dx.doi.org/10.2139/ssrn.2941001

Frankish, K. (ed.) (2014) *The Cambridge handbook of Artificial Intelligence*. Cambridge: Cambridge University Press.

Gray, M.L.; Suri, S. (2019) *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass*. New York: Houghton Mifflin Harcourt Publishing.

Kaplan, J. (2017) *Artificial Intelligence: What Everyone Needs to Know*. Oxford: Oxford University Press.

Lacity, M.; Willcocks, L. (2018) *Robotic Process and Cognitive Automation*. Ashford: SB Publishing.

Lin, P. et al. (2017) *Robot Ethics 2.0: from Autonomous Cars to Artificial Intelligence*. Oxford: Oxford University Press.

Morgan, J. (2019) Will we work in twenty-first century capitalism? A critique of the fourth industrial revolution literature, *Economy and Society*, 48(3): 371-398.

Richards, Neil M. and Smart, William D, How Should the Law Think About Robots? (May 10, 2013). Available at http://dx.doi.org/10.2139/ssrn.2263363

Van Rijmenam, M., 2019. *The Organisation of Tomorrow: How AI, blockchain and analytics turn your business into a data organisation*. Routledge.

Schwab, K. (2016) The Fourth Industrial Revolution. Geneva: World Economic Forum.

Willcocks, L. et al. (2019) *Becoming Strategic with Robotic Process Automation*. Ashford: SB Publishing.

In addition, it is essential that students keep abreast of contemporary events and developments. There are many sources available for this, but key online sources include:

BBC: https://www.bbc.co.uk/news/business/economy

European Union: at http://europa.eu/index_en.htm

Financial Times: students have subscription access to this at https://www.ft.com/ Forbes:

http://www.forbes.com

International Economics Study Centre: at www.internationalecon.com

International Monetary Fund: at www.imf.org

Harvard Business Review: www.hbr.org

McKinsey: https://www.mckinsey.com/featured-insights/artificial-intelligence

MIT Technology Review: www.technologyreview.com

OECD: accessed at www.oecd.org

The Economist: at http://www.economist.com/