H9DGC: Data Governance, Ethics, and Sustainability

Module Code:	H9DGC
Long Title	Data Governance, Ethics, and Sustainability APPROVED
Title	Data Governance, Ethics, and Sustainability
Module Level:	LEVEL 9
EQF Level:	7
EHEA Level:	Second Cycle
Credits:	5
Module Coordinator:	Vanessa Ayala-Rivera
Module Author:	Maurice Keady
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	Lecturer PhD/Master's degree in a computing or cognate discipline. May have industry experience also. Tutor PhD/Master's degree in a computing or cognate discipline. May have industry experience also.

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
LO1	Demonstrate critical understanding of the governance and regulatory frameworks associated with the key data lifecycle stages for an effective and ethical management of data assets.
LO2	Demonstrate critical awareness and interpretation of the fundamental principles and regulatory regimes of data protection and data privacy in socio-technical environments.
LO3	Critically analyse and evaluate the main ethical, legal, sustainability, and social implications of using data-driven technologies.
LO4	Apply core concepts of sustainability, data governance, ethics, and data protection to address sustainability challenges in a global context and to support ethical and sustainable decision making.
LO5	Appraise the interplay of fairness, accountability, and transparency in algorithmic decision-making systems and evaluate operational and technical solutions to address these concerns.

Dependencies	
Module Recommendations	
No recommendations listed	
Co-requisite Modules	
No Co-requisite modules listed	
Entry requirements	Programme entry requirements must be satisfied.

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Module Content & Assessment

Indicative Content

Data Management and Governance I
Data management principles and challenges; Data lifecycle; Data quality; Data provenance; Data integrity.

Data Management and Governance II
Data policies, standards, guidelines, and procedures; Business metrics and KPIs; Roles and responsibilities; DG maturity levels; Data governance frameworks, operating models, and tools.

Data Management and Governance III
How to implement a data governance program (e.g., Ladley's methodology); Fundamentals of Research Data Management (e.g., research data lifecycle, data sharing, research data management planning).

Governance for Sustainable Development
Sustainability Terminologies and Meanings; UN Sustainable Development Goals (SDGs); Environmental, social, and corporate governance (ESG); Sustainable IT.

Regulatory Compliance I
Brief history of human rights; Types of EU legislation; The Right to Privacy; Key legislative frameworks;

Regulatory Compliance II
Key provisions in the GDPR (e.g., data protection principles, privacy by design; data subjects rights, data processor and data controller, international data transfers, informed consent, data protection impact assessment).

Regulatory Compliance III
Data Privacy and Anonymization; Privacy and regulatory compliance issues pertaining to specific sectors (e.g., fintech, cloud computing); Surveillance; EU digital agenda (e.g., AI regulation).

Ethical Issues Pertaining to Data I
Nature and sources of ethics (e.g., personal, professional, social, business); Branches of normative ethics (deontology, utilitarianism, virtue theory, social justice, etc.); Frameworks for ethical design and decision making (e.g., Ethical Impact Assessment).

Ethical Issues Pertaining to Data II
Ethical perspective of data governance (how DG supports ethics, principles, and modes of governance with ethics considerations); Ethics in Research: considerations Before, During, and After; Codes of ethics and professional conduct (e.g., ACM)

Ethical Issues Pertaining to Data III
Ethic concerns in various technologies and sustainable socio-technical systems (e.g., IoT, machine learning); IT Ethics in specific sectors (e.g., spam, anonymity, cyberbullying, copyright, etc.)

Model Governance and Explainable AI - Part 1
Principles of AI Governance; the meaning of fairness, accountability, and transparency with respect to algorithmic systems; Unconscious Bias and techniques to address it; Perceptions of algorithmic bias and unfairness; Interventions to mitigate biases in systems; Methods and tools for enhancing fairness in algorithms (e.g., IEEE P7003 TM).

Model Governance and Explainable AI - Part 2
Principles and Strategies for designing accountable algorithms and systems; Trade-offs between privacy and transparency; Tools and methodologies for conducting algorithm audits (e.g., Algorithmic Impact Assessments).

Assessment Breakdown	%
Coursework	40.00%
End of Module Assessment	60.00%

Assessments

Full Time

Coursework

Assessment Type:	Continuous Assessment	**% of total:**	40
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4
Non-Marked:	No		

Assessment Description:
This assessment will assess learners' insights and evaluation of data management and governance, legal, and sustainability issues relating to situational contexts and scenarios. Students will work in groups.

Assessment Type:	Formative Assessment	**% of total:**	Non-Marked
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	Yes		

Assessment Description:
Formative assessment will be provided on the in-class individual or group activities. Feedback will be provided in written or oral format, or on-line through Moodle. In addition, in class discussions will be undertaken as part of the practical approach to learning.

End of Module Assessment

Assessment Type:	Terminal Exam	**% of total:**	60
Assessment Date:	End-of-Semester	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	No		

Assessment Description:
The examination will be of two hours duration and may include a mix of: theoretical, applied and interpretation questions.

No Workplace Assessment

Reassessment Requirement

Coursework Only
This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.

Reassessment Description
The reassessment strategy for this module will consist of a terminal examination that will assess all learning outcomes.

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Module Workload

Module Target Workload Hours 0 Hours

Workload: Full Time

Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom and demonstrations	24	Per Semester	2.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Independent Learning Time	Independent learning	89	Per Semester	7.42
			Total Weekly Contact Hours	3.00

Workload: Blended

Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Independent Learning Time	Independent learning	89	Per Semester	7.42
Directed Learning	Directed e-learning	12	Per Semester	1.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Lecture	Classroom and demonstrations	12	Per Semester	1.00
			Total Weekly Contact Hours	3.00

Workload: Part Time

Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom and demonstrations	24	Per Semester	2.00
Tutorial	Mentoring and small-group tutoring	12	Per Semester	1.00
Independent Learning	Independent learning	89	Per Semester	7.42
			Total Weekly Contact Hours	3.00

Module Resources

Recommended Book Resources

Dama International. (2017), DAMA-DMBOK: Data Management Body of Knowledge, 2nd Ed. Technics Publications, [ISBN: 978-1634622349].

John Ladley. (2019), Data Governance: How to design, deploy, and sustain an effective data governance program, Academic Press, p.300, [ISBN: 9780128158319].

Katherine O'Keefe,Daragh O Brien. (2018), Ethical Data and Information Management, Kogan Page, [ISBN: 978-0749482046].

Sanjay Sharma. (2019), Data Privacy and GDPR Handbook, John Wiley & Sons, p.496, [ISBN: 978-1119594246].

Barocas, S., Hardt, M. and Narayanan, A.,. (2019), Fairness and Machine Learning: Limitations and Opportunities,, fairmlbook.org..

Supplementary Book Resources

Robert F. Smallwood. (2019), Information Governance: Concepts, Strategies and Best Practices, John Wiley & Sons, p.548, [ISBN: 978-1119491446].

Michael Kearns,Aaron Roth. (2019), The Ethical Algorithm: The Science of Socially Aware Algorithm Design., Oxford University Press, USA, p.229, [ISBN: 978-0190948207].

HERMAN T. TAVANI. ETHICS AND TECHNOLOGY, [ISBN: 978-1119355311].

Reynolds, George W.. (2019), Ethics in Information Management, 6th Ed. Cengage Learning (Inc.),,, Boston, [ISBN: 978-337-40587-4].

West, S.M., Whittaker, M. and Crawford, K.,. (2019),. Discriminating systems., AI Now..

Jennifer L. Eberhardt, PhD. (2020), Biased, Biased: Uncovering the hidden prejudice that shapes what we see, think, and do., p.370, [ISBN: 978-0735224957].

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note: