

Module: Data Science 381

Module name:	Data Science 381
Code:	DTS381
NQF level:	8
Type:	Fundamental – Bachelor of Computing (Data Science stream)
Contact Time:	134 hours
Structured time:	16 hours
Self-Directed Time	150 hours
Notional hours:	300 hours
Credits:	30
Prerequisites:	DWH281,MLG381

Purpose

The Data Science course deals with technologies, applications and practices for the collection, integration, analysis, and presentation of business information in order to support better business decision making. Furthermore during this module students will learn how to present actionable data to help corporates and companied also end users make informed business decisions.

Outcomes

Upon successful completion this module, the student will be able to

- Demonstrate engaging knowledge on the use of classification models and datamining techniques as found in the field of Data Science, demonstrate an appreciation of the theories, research methodologies, methods and techniques in the expanding field that is Data Science and how one would apply such knowledge.
- Ability to interrogate multiple sources of knowledge systematically and analytically understanding the future of Data Science and to evaluate knowledge and processes of knowledge production within this expanding field study.
- A learner is able to demonstrate an understanding of the complexities and uncertainties of selecting, applying or transferring datamining techniques along with machine learning algorithms to unfamiliar problems in Data Science.
- Demonstrate the ability to use a range of models, algorithms and statistical techniques, analyse and address abstract problems within the Data Science domain drawing systematically on the body of knowledge appropriate to the field.
- Producing and communicating information regarding the systematic gathering of data mining results and being able to present and communicate ideas and results effectively to a range of audiences, offering creative insights, rigorous interpretations and solutions to problems.
- Demonstrate the ability to identify and address ethical issues faced when working with information and or personal data of people critically reflecting on the suitability of different ethical value systems when working with information.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through 6 formative tests and a summative test.
- Continuous evaluation of seven small projects, whereby the student must model and apply several Data mining algorithms for a given Data Science scenario in order to create insightful and actionable business information.
- Final assessment through a written examination.

Teaching and Learning

Learning materials

- 📖 S. David; Practical Data Science for Information Professionals, 1st Edition. Facet Publishing, © 2020. ISBN-13: 978-1-78-330344-1, ISBN-10: 1-22-623922-7;

Additional Reading

- 📖 Inmon H. William: »Building The Data Warehouse: 4th Edition«, Wiley Publishing, Inc., 2005, ISBN: 978-0-7645-9944-6.
- 📖 Hubbard W. Douglas: »How To Measure Anything: Finding the Value of Intangibles in Business«, 2nd Edition, 2010, ISBN: 978-0-470-53939-2.
- 📖 Lehn HP (1958) A business intelligence system. IBM J Res Dev 2(4):314–319
- 📖 Roebuck K (2011) Business intelligence (BI): high-impact strategies—what you need to know: definitions, adoptions, impact, benefits, maturity, vendors. Emereo, ISBN: 9781743046289
- 📖 R. Sharda, D. Delen, & E. Turban; Business Intelligence and Analytics. Systems for Decision Support, 10th Edition. Pearson/Prentice Hall, © 2015. ISBN-13: 978-0-13-305090-5, ISBN-10: 0-13-305090-4;

Learning activities

Teaching will be a combination between presentation of theoretical concepts and exercises and discussions. It has an interactive practical approach, with mandatory small projects which must be completed during the course.

Notional learning hours

List the learning activities in hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		93.0		43.0
Formative feedback		14.0		
Project	7	27.0		42.0
Assignment				
Test	7		14.0	23.0
Exam	1		2.0	42.0
		134.0	16.0	150.0

Syllabus

- Overview of Data Science and analytics
- Data Science and Information Exploitation

- The Value of Data Science
- Developing Your Data Science Roadmap
- The Data Science Environment
- Business Processes and Information Flow
- Data Requirements Analysis
- Foundation and Technologies for decision Making
- Predictive Analytics – Data Mining
- Predictive Analytics – Text Analytics and Text Mining
- Predictive Analytics – Web Analytics and Web Mining
- Model Based Decision Making
- Modelling and Analysis
- Knowledge Management and Collaborative Systems
- Big Data and Analytics
- Business Analytics: Emerging Trends and Future Impacts
- Project Presentations