Course Outline

Business Intelligence and Analytics

INFS 4018 Study Period 5 - 2019

Internal - Mawson Lakes Campus

University of South Australia

Introduction

Welcome

Welcome to the course Business Intelligence and Analytics (BIA).

The use of data in decision-making is essential for organisations of all sizes. Large organisations already routinely acquire, integrate and make available internal and external data to decision makers using sophisticated tools and techniques; smaller organisations are catching up. The fields of business intelligence and analytics (including data mining) have consistently been top investment priorities. With the new capacities of self-serve, visualisations and cloud-based (web-based) technologies, organisations have an ever-increasing number of possibilities to use the exploding volume of data for better strategic, tactical and day-by-day decisions.

This course explores the underlying principles of BIA and then looks further into the analytic tools that explore enterprise data. This course offers an opportunity to experience some of the best known commercial BIA software systems.

Course Teaching Staff

Course Coordinator:	Dr Jan Stanek
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* Please refer to your Course homepage for the most up to date list of course teaching staff.

School Contact Details

School of Information Technology and Mathematical Sciences

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School Website:	http://www.unisa.edu.au/IT-Engineering-and-the-Environment/Information-Technology-and-Mathematical-Sciences/

Course Overview

Prerequisite(s)

There are no prerequisite courses to be completed before this course can be undertaken.

Corequisite(s)

There are no corequisite courses to be completed in conjunction with this course.

Course Objectives

On completion of this course, students should be able to:

CO1. Explain the nature and role of BI and analytics in contributing to the delivery of business value and competitive advantage in modern organisations.

CO2. Differentiate the concepts of business analytics, business performance management and measurement.

CO3. Compare and evaluate key data analytics methods, be able to discuss the pros and cons of those methods.

CO4. Choose appropriate BI and analytical tools and techniques to implement a business strategy.

CO5. Use BI and analytics software tools to solve real world problems .

Upon completion of this course, students will have achieved the following combination of Graduate Qualities and Course Objectives:

	Graduate Qualities being assessed through the course						
	GQ1	GQ2	GQ3	GQ4	GQ5	GQ6	GQ7
CO1	•	•					
CO2	•	•				•	
CO3	•	•				•	
CO4	•	•		•	•		
CO5	•	•				•	

Graduate Qualities

A graduate of UniSA:

GQ1. operates effectively with and upon a body of knowledge of sufficient depth to begin professional practice

GQ2. is prepared for life-long learning in pursuit of personal development and excellence in professional practice

GQ3. is an effective problem solver, capable of applying logical, critical, and creative thinking to a range of problems

GQ4. can work both autonomously and collaboratively as a professional

GQ5. is committed to ethical action and social responsibility as a professional and citizen

GQ6. communicates effectively in professional practice and as a member of the community

GQ7. demonstrates international perspectives as a professional and as a citizen

Course Content

1) Motivation for BI
- The challenge of turbulent business environments: overview, major issues and needs for business intelligence and analytics.
- The need for analytics and data mining technologies in competitive business environments

2) Theory behind BI and Analytics
- The BI lifecycle model and development approaches, the costs, benefits, return on investment and user community.
- Business analytics and business performance management: linking strategy to execution, the link between corporate and BI strategy, differences between performance management and measurement.
- Privacy, ethical and legal issues.

3) Applied BI and analytics
- The components and comparison of various common and emerging BIA system architectures
- Data integration and the extraction, transformation, and load (ETL) processes, administration and security issues
- Data Warehouse modelling and implementation success factors.
- Review of contemporary BI applications in various industries;
- Market basket analysis need for analytics and data mining and association rule mining.
- Modelling customer behaviours and predictions.
- Clustering analysis and outlier detections.
- Use of BI and analytics tools in data analysis and knowledge discovery.

Teaching and Learning Arrangements

Lecture	1 hour x 13 weeks
Computer Practical	2 hours x 9 weeks

Unit Value

4.5 units

Use of recorded material

This course will involve the production of audio and/or video recordings of UniSA students. To protect student privacy, you must not at any time disclose, reproduce or publish these recordings, or related material, in the public domain including online, unless the videoed students give consent for reproduction, disclosure or publication. This requirement is consistent with University statutes, by-laws, policies, rules and guidelines which you agreed to abide by when you signed the Student Enrolment Declaration.

Learning Resources

Textbook(s)

There are no textbooks listed for this course.

Reference(s)

All references are accessible through UniSA Library website

Gartner research
IBISworld industry research
Grossmann, Wilfried; Rinderle-Ma, Stefanie. Fundamentals of business intelligence. Heidelberg : Springer, 2015
Ng, Raymond T.; Arocena, Patricia C.; Barbosa, Denilson; Carenini, Giuseppe. Perspectives on Business Intelligence. Morgan & Claypool Publishers 2013.
Bert Brjis. Business Analysis for Business Intelligence. CRC Press 2013.
Daniel J. Power. Decision Support, Analytics, and Business Intelligence. 2nd edition. Business Expert Press 2013.
Minelli, Michael; Chambers, Michele ; Dhiraj, Ambiga. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses. Wiley 2012.
Jerzy Surma. Business Intelligence Making Decisions Through Data Analytics. Business Expert Press 2011.

Materials to be accessed online

learnonline course site

All course related materials can be accessed through your learn**online** course site which you will be able to access from the my Courses section in myUniSA.

myUniSA

All study related materials can be accessed through: https://my.unisa.edu.au

Assessment

Assessment Details

Details of assessment submission and return are listed under each assessment task. Assessment tasks will be returned to you within two to three weeks of submission.

If the Course Coordinator allows submissions in hard copy format, you will be required to attach an Assignment Cover Sheet which is available on the learnonline student help (https://lo.unisa.edu.au/mod/book/view.php?id=1843&chapterid=567) and in myUniSA.

Assessment Summary

#	Form of assessment	Length	Duration	Weighting	Due date (Adelaide Time)	Submit via	Objectives being assessed
1	Assignment 1	1500 words	N/A	25%	22 Sep 2019, 11:59 PM	learnonline	CO1, CO2, CO4, CO5
2	Assignment 2	2000 words	N/A	25%	3 Nov 2019, 11:59 PM	learnonline	CO1, CO2, CO4, CO5
3	Practical	1 hour per week	13 weeks	10%	*See assessment activities for details*	*See assessment activities for details*	CO3, CO4, CO5
4	Examination	N/A	1.5 hours	40%	Other - TBA	In person	CO1, CO2, CO3, CO4

Feedback proformas

The feedback proforma is available on your learn**online** course site. It can be accessed via the Feedback Form link in the Course Essentials block.

Assessments

Dataset analysis - 1st part (Graded)

What is involved

- *Business understanding* (read about the themes related to the given data set; discuss contexts; define focus of your exploration and propose other data sets which will support your analysis)
- *Data understanding* (explore contexts of the data - how the data was collected, data quality, semantics and basic description of what you have; this includes visualizations and simple statistics)
- *Planning your analysis* (propose a plan on how you are going to analyse your data - both what is given on the course page and any additional data sets you propose)

Specific details will be given int he assignment description.

Assignment 2 (Graded)

Execution of the analysis plan and reporting

This is the second part of the analytic task. You are expected to:

- *analyse the data* (do any necessary data transformations; apply whatever methods you planned)
- *evaluate your results* (evaluate your results from the point of view of validity - issues such as over fitting...; and in relation to the problem you try to solve).

- *write a comprehensive report* (findings; interpretations and recommendations)

Details of this task will be in the specific assignment document.

Practicals (Graded)

Assessment Activities

Name	Sub-weighting	Due date (Adelaide Time)	Submit via
Power BI - Visualisation	All activities equally weighted	18 Aug 2019, 11:59 PM	learnonline
Power BI - Data connection	All activities equally weighted	25 Aug 2019, 11:59 PM	learnonline
Tableau - Get started	All activities equally weighted	1 Sep 2019, 11:59 PM	learnonline
Tableau - Blending & granularity	All activities equally weighted	8 Sep 2019, 11:59 PM	learnonline
Disco - Process mining	All activities equally weighted	15 Sep 2019, 11:59 PM	learnonline
Weka - Classification	All activities equally weighted	22 Sep 2019, 11:59 PM	learnonline
Weka - Association rule mining & Model evaluation	All activities equally weighted	13 Oct 2019, 11:59 PM	learnonline
Tensorflow Playground	All activities equally weighted	20 Oct 2019, 11:59 PM	learnonline

Details for each submission are listed in the practical task published on the course website. Any changes to the submission date will be published on the course website.

Examination

The examination will cover topics from the entire course, as presented in the lecture slides, practicals and the assignment.

Submission and return of assessment tasks

See above under Assessment details.

Exam Arrangements

Students will receive advance notice of scheduled examination. All students are required to sit their examination at the scheduled date, time and location irrespective of any conflict with a planned holiday or special event. Internal students are required to sit their examination on-campus or at the central exam venue.
More information about examination procedures and arrangements for students can be found by consulting the relevant policy http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/ (Section 6)

Variations to exam arrangements

Extra time in exams (ENTEXT) and the use of a dictionary is available to some students (for example, Indigenous Australian students and those of non-English speaking background) as follows:

- extra time for reading or writing. This will be an extra ten minutes per hour for every hour of standard examination time, and
- the use of an English language or bilingual print dictionary (without annotations). (APPM 7.2.2)

More information about variation to assessment is available in section 7.2 of the Assessment Policy and Procedures Manual. http://w3.unisa.edu.au/policies/manual/default.asp (section 7)

Supplementary Assessment

Supplementary assessment or examination offers students an opportunity to gain a supplementary pass (SP) and is available to all students under the following conditions unless supplementary assessment or examination has not been approved for the course:

1. if the student has achieved a final grade between 45-49 per cent (F1) in a course
2. if a student who has successfully completed all of the courses within their program, with the exception of two courses in which they were enrolled in their final study period, a supplementary assessment or examination may be granted where the final grade in either or both of these courses, is less than 45 percent (F1 or F2) and all assessments in the courses were attempted by the student. Supplementary assessment will not be available for a course under investigation for academic integrity until the investigation is completed, and determined that it did not constitute academic misconduct.

More information about supplementary assessment is available in section 7.5 of the Assessment Policy and Procedures Manual.
http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Supplementary assessment or examination is available for this course.

Important information about all assessment

All students must adhere to the University of South Australia's policies about assessment: http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/.

Additional assessment requirements

Students must obtain a minimum mark of 40% in the exam and achieve an overall mark of 50% in the course to pass.

Students with disabilities or medical conditions

Students with disabilities or medical conditions or students who are carers of a person with a disability may be entitled to a variation or modification to standard assessment arrangements. See Section 7 of the Assessment Policy and Procedures Manual (APPM) at: http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/

Students who require variations or modifications to standard assessment arrangements should make contact with their Course Coordinator as early as possible in order to ensure that appropriate supports can be implemented or arranged in a timely manner.

Students can register for an Access Plan with UniSA Access & Inclusion Service. It is important to make contact early to ensure that appropriate support can be implemented or arranged in a timely manner. See the Disability Hub for more information: http://www.unisa.edu.au/Disability/Current-students

Students are advised there is a deadline to finalise Access Plan arrangements for examinations. Further information is available at: http://i.unisa.edu.au/campus-central/Exams_R/Before-the-Exam/Alternative-exam-arrangements/

Deferred Assessment or Examination

Deferred assessment or examination is available for the course.

Special Consideration

Special consideration is available for this course. Note: Special consideration cannot be granted for a deferred assessment or examination, or a supplementary assessment or examination. APPM 7.7.6

Variations to assessment tasks

Variation to assessment methods, tasks and timelines may be provided in:

Unexpected or exceptional circumstances, for example bereavement, unexpected illness (details of unexpected or exceptional circumstances for which variation may be considered are discussed in clauses 7.8 - 7.10 of the Assessment Policy and Procedures Manual). Variation to assessment in unexpected or exceptional circumstances should be discussed with your course coordinator as soon as possible.

Special circumstances, for example religious observance grounds, or community services (details of special circumstances for which variation can be considered are discussed in clause 7.11 of the Assessment Policy and Procedures Manual). Variations to assessment in expected circumstances must be requested within the first two weeks of the course (or equivalent for accelerated or intensive teaching).

Students with disabilities or medical conditions please refer to **Students with disabilities or medical conditions**.

Academic Integrity

Academic integrity is the foundation of university life and is fundamental to the reputation of UniSA and its staff and students. Academic integrity means a commitment by all staff and students to act with honesty, trustworthiness, fairness, respect and responsibility in all academic work.

An important part of practising integrity in academic work is showing respect for other people's ideas, and being honest about how they have contributed to your work. This means taking care not to represent the work of others as your own. Using another person's work without proper acknowledgement is considered Academic Misconduct, and the University takes this very seriously.

The University of South Australia expects students to demonstrate the highest standards of academic integrity so that its degrees are earned honestly and are trusted and valued by its students and their employers. To ensure this happens, the University has policies and procedures in place to promote academic integrity and manage academic misconduct. For example, work submitted electronically by students for assessment will be examined for copied and un-referenced text using the text comparison software Turnitin http://www.turnitin.com.

More information about academic integrity and what constitutes academic misconduct can be found in Section 9 of the Assessment Policies and Procedures Manual (APPM): http://i.unisa.edu.au/policies-and-procedures/codes/assessment-policies/. The Academic Integrity Module explains in more detail how students can work with integrity at the University: https://lo.unisa.edu.au/mod/book/view.php?id=252142

Further Assessment Information

Assignments that are late will incur a 10% per day penalty unless an extension is explicitly granted by the Course Coordinator.

Action from previous evaluations

Towards the end of the study period you will be asked to provide feedback on the course. It is very important for us to receive your valuable feedback so we can improve the course.This will be accessible through a link on the course homepage. Please take a few moments to complete this. Your feedback is confidential and it is taken seriously.

Course Calendar

Study Period 5 - 2019

	Weeks	Topic	Assessment Details (Adelaide Time)	Public Holidays
	15 - 21 July	Pre-teaching		
1	22 - 28 July	Introduction		
2	29 July - 4 August	Data Science Methodology		
3	05 - 11 August	Successful BI		
4	12 - 18 August	Business Metrics	Practicals: Power BI - Visualisation due 18 Aug 2019, 11:59 PM	
5	19 - 25 August	Data Visualisation	Practicals: Power BI - Data connection due 25 Aug 2019, 11:59 PM	
6	26 August - 1 September	Data Warehousing	Practicals: Tableau - Get started due 01 Sep 2019, 11:59 PM	
7	02 - 8 September	Enterprise data mining	Practicals: Tableau - Blending & granularity due 08 Sep 2019, 11:59 PM	
8	09 - 15 September	Data Mining 1 (Supervised Learning)	Practicals: Disco - Process mining due 15 Sep 2019, 11:59 PM	
9	16 - 22 September	Data Mining 2 (Unsupervised Learning)	Dataset analysis - 1st part due 22 Sep 2019, 11:59 PM Practicals: Weka - Classification due 22 Sep 2019, 11:59 PM	
	23 - 29 September	Mid-break		
	30 September - 6 October	Mid-break		
10	07 - 13 October	Machine Learning & Neural Networks	Practicals: Weka - Association rule mining & Model evaluation due 13 Oct 2019, 11:59 PM	Labour Day 7/10/2019
11	14 - 20 October	Privacy, Ethics and Legal	Practicals: Tensorflow Playground due 20 Oct 2019, 11:59 PM	
12	21 - 27 October	BIA Cast studies		
13	28 October - 3 November	Revision	Assignment 2 due 03 Nov 2019, 11:59 PM	
	04 - 10 November	Swot-vac		
	11 - 17 November	Exam week		
	18 - 24 November	Exam week		