Unit Outline Winter, 2011
Faculty of Information Sciences & Engineering

Data Analytics and Business Intelligence PG
8697
This Unit Outline must be read in conjunction with:

a) *UC Student Guide to Policies*, which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at *(scroll to bottom of page)*
   http://www.canberra.edu.au/student-services

b) *UC Guide to Student Services*, and is available at *(scroll to bottom of page)*
   http://www.canberra.edu.au/student-services

c) Any additional information specified in section 6h.

### 1: General Information

1a **Unit title:** *Data Analytics and Business Intelligence PG*

1b **Unit number:** 8697

1c **Semester and year offered:** *Winter, 2011*

1d **Credit point value:** 3

1e **Unit level:** *PG*

1f **Name of Unit Convener and contact details (including telephone and email)**

   Alice Richardson  
   Office: 11B15  
   Phone: 6201 2444  
   Email: Alice.Richardson@canberra.edu.au

   **Moderator:** Dharmendra Sharma  
   Office: 11B14  
   Phone: 6201 2153  
   Email: Dharmendra.Sharma@canberra.edu.au

1g **Administrative contact details (including name, location, telephone and email)**

   Office: 11B27, 6201 2417, ise@canberra.edu.au
2: Academic Content

2a Unit description and learning outcomes

This unit introduces students to the tools and techniques of data analytics with application to business intelligence. Students will be introduced to the main tools of data analytics, both descriptive and predictive. Case studies will provide the links to intelligence that businesses, in the broadest sense of the term, can use. The unit is designed to be of interest to students in a range of disciplines including health, education, sport and management.

A student will be expected to be able to
1. Source and access data from a variety of databases
2. Select and apply appropriate tools for data visualisation
3. Select and apply descriptive data analytics methods
4. Select and apply predictive data analytics methods
5. Fit statistical models
6. Use the results to produce business intelligence in a variety of settings

2b Generic skills

This unit primarily addresses the UC graduate attributes stated in the following terms.

1. Information Literacy and Numeracy
   Graduates are expected to be able to locate, identify, collate, analyse, manipulate, evaluate, interpret and present information and numerical data.

2. Information and Communication Technology
   Graduates are expected to be able to select and use appropriate information and communication technology to retrieve, manipulate and present information.

3. Problem Solving
   Graduates are expected to be able to:
   (a) identify problems and analyse the main features of problems relevant to their professional field;
   (b) apply appropriate problem solving processes, arguments, critical and creative thinking;
   (c) implement and evaluate strategies for the resolution of problems.

2c Prerequisites and/or co-requisites

Introduction to Statistics (6540), Business Statistics (5123) or an equivalent statistics unit at a university level.

3: Delivery of Unit and Timetable

3a Delivery mode: Standard face-to-face teaching at UC Bruce campus.

3b Timetable of activities

<table>
<thead>
<tr>
<th></th>
<th>Day</th>
<th>Time</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture A</td>
<td>Tuesday</td>
<td>12:30 – 2:30</td>
<td>2B11</td>
</tr>
<tr>
<td>Lab 1</td>
<td>Thursday</td>
<td>2:30 – 4:30</td>
<td>11B37</td>
</tr>
</tbody>
</table>
Each student should attend a 2 hour lecture and a 2 hour laboratory session per week. The lectures alone are the definitive guide to the unit and will define what appears on the tests and final exam. The website, textbook and other unit materials do not provide this.

3b Schedule of topics

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity. Minor variations to the sequence of activities may occur.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 June</td>
<td>1 Showcase</td>
</tr>
<tr>
<td>21 June</td>
<td>2 Sourcing and preparing data</td>
</tr>
<tr>
<td>28 June</td>
<td>3 Data visualisation</td>
</tr>
<tr>
<td>5 July</td>
<td>4 Descriptive analytics: cluster analysis</td>
</tr>
<tr>
<td>12 July</td>
<td>5 Predictive analytics: association rules</td>
</tr>
<tr>
<td>19 July</td>
<td>6 Predictive analytics: decision trees and random forests</td>
</tr>
<tr>
<td>26 July</td>
<td>7 Machine learning: neural networks</td>
</tr>
</tbody>
</table>

4: Unit Resources

4a Lists of required texts/readings


The preprint version of this text will be provided to students in an electronic format.

4b Materials and equipment

Scientific calculator, which can be purchased at the Union shop, electronics shops e.g. Dick Smith, or newsagents. Access to Building 11 PC laboratories.

4c Unit website

The unit website is accessed through Moodle.
5: Assessment

5a Assessment overview

<table>
<thead>
<tr>
<th>Assessment item (including exams held in the exam period)</th>
<th>Due date of assignments</th>
<th>Weighting (total to equal 100%)</th>
<th>Addresses learning outcome(s) [for numbering see section 2a]</th>
<th>Addresses generic skill(s) [for numbering see section 2b]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised quiz</td>
<td>In lab of Weeks 3 &amp; 6</td>
<td>Up to 40%</td>
<td>1 - 6</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Unsupervised quiz</td>
<td>Weeks 2,4,5 &amp; 7</td>
<td>Up to 20%</td>
<td>1 - 6</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Assignment</td>
<td>17:00 5 August</td>
<td>Up to 40%</td>
<td>1 - 6</td>
<td>1 - 3</td>
</tr>
<tr>
<td>Take home exam</td>
<td>17:00 8 August</td>
<td>Up to 40%</td>
<td>1 - 6</td>
<td>1 - 3</td>
</tr>
</tbody>
</table>

5b Details of each assessment item

Assessment will be based on a combination of interim assessment and a major assignment.

Supervised quizzes: up to 40%
There will be two supervised quizzes, held during the lab session on the following days:
- Thursday 30 June
- Thursday 21 July
These quizzes will be open book. Students may bring any material required. They will be a written test of your skills in data mining and business intelligence.

Absences from either of the supervised quizzes will need to be explained. Contact the unit lecturer as soon as you know you will be unable to attend either of the quizzes. You are required to contact the unit lecturer within 3 days of a missed quiz with an acceptable explanation and supporting documents. A deferred quiz will be made available by arrangement, providing the above criteria are fulfilled.

Online quizzes: up to 20%
Online quizzes will be made available for weeks 2, 4, 5 and 7. They should be competed by Sunday 23.55 pm on the week they are due.

Assignment: up to 40%
The assignment will be an opportunity to apply several data mining techniques to a data set and extract business intelligence from it.

Your grade will be determined on the basis of a composite score. There are two possible assessment paths, depending on whether you wish to obtain a pass, or a credit to high distinction grade.

Path A
Students wishing to obtain a pass are not required to do any further assessment. Your mark will be determined on the basis of a composite score, which will then be scaled to a numerical grade consistent with the descriptors for Pass and Fail, as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass (P)</td>
<td>50-100</td>
</tr>
<tr>
<td>Fail</td>
<td>0-49</td>
</tr>
</tbody>
</table>
**Path B - Take home exam: Up to 40%**
For students wishing to achieve a credit to a high distinction in the unit, a take home exam will be made available in week 8. This take home exam will be worth up to 40%.

Your grade will be determined on the basis of a composite score obtained by taking 40% of the take home exam mark and 60% of the total score for the other assessment components. This composite score will then be scaled to a numerical grade consistent with the descriptors:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass (P)</td>
<td>50-64</td>
</tr>
<tr>
<td>Credit (CR)</td>
<td>65-74</td>
</tr>
<tr>
<td>Distinction (DI)</td>
<td>75-84</td>
</tr>
</tbody>
</table>
| High Distinction (HD) | 85-100 *

5c **Special assessment requirements**
See 5b.

5d **Supplementary assessment**

5e **Academic Integrity**
Students should uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices which contravene academic values.

5f **Text-matching software**

It is not expected that text-matching software will be used in this unit.

**6: Student Responsibility**

6a **Workload**
The amount of time you will need to spend on study in this unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp unit the total notional workload over the semester or term is assumed to be 150 hours. These hours include time spent in classes. The total workload for units of different credit point value should vary proportionally. For example, for a 6cp unit the total notional workload over a semester or term is assumed to be 300 hours.

6b **Special needs**
Students who need assistance in undertaking the unit because of disability or other circumstances should inform their Unit Convener or UC AccessAbility (formerly the Disabilities Office) as soon as possible so the necessary arrangements can be made.

6c **Attendance requirements**
Attendance at lectures and tutorials is not a condition for receiving a Pass grade or better.

6d **Withdrawal**
If you are planning to withdraw please discuss with your unit convener. Please see this link for further information on deadlines.

6e Required IT skills
Familiarity with basic computer use is assumed. Familiarity with Microsoft Office software (Word, Excel etc.) is assumed.

6f Costs
Purchase of the textbook and some printing costs are possible. You will be expected to have or to purchase a basic scientific calculator.

6g Work Integrated Learning
This unit is available for study as part of a number of courses. Please consult your course convener for work-integrated learning opportunities within your course.

6h Additional information
None

7: Student Feedback

All students enrolled in this unit will have an opportunity to provide anonymous feedback on the unit at the end of the Semester via the Unit Satisfaction Survey (USS) which will be presented to you on OSIS. Your lecturer or tutor may also invite you to provide more detailed feedback on their teaching through an anonymous in-class questionnaire administered through the University’s Teaching and Learning Centre (TLC).

8: Authority of this Unit Outline

Any change to the information contained in Section 2 (Academic content), and Section 5 (Assessment) of this document, will only be made by the Unit Convener if the written agreement of Head of Discipline and a majority of students has been obtained; and if written advice of the change is then forwarded to each student enrolled in the unit at their registered term address. Any individual student who believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.