

## H9DAPA: Domain Applications of Predictive Analytics

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| <b>Module Code:</b>                                                          | H9DAPA                                                                                                                                                                                       |
| <b>Long Title</b>                                                            | Domain Applications of Predictive Analytics <b>APPROVED</b>                                                                                                                                  |
| <b>Title</b>                                                                 | Domain Applications of Predictive Analytics                                                                                                                                                  |
| <b>Module Level:</b>                                                         | LEVEL 9                                                                                                                                                                                      |
| <b>EQF Level:</b>                                                            | 7                                                                                                                                                                                            |
| <b>EHEA Level:</b>                                                           | Second Cycle                                                                                                                                                                                 |
| <b>Credits:</b>                                                              | 5                                                                                                                                                                                            |
| <b>Module Coordinator:</b>                                                   | Vikas Sahni                                                                                                                                                                                  |
| <b>Module Author:</b>                                                        | Jenette Carson                                                                                                                                                                               |
| <b>Departments:</b>                                                          | School of Computing                                                                                                                                                                          |
| <b>Specifications of the qualifications and experience required of staff</b> | Master's degree or higher in a computing or cognate discipline.                                                                                                                              |
| <b>Learning Outcomes</b>                                                     |                                                                                                                                                                                              |
| <i>On successful completion of this module the learner will be able to:</i>  |                                                                                                                                                                                              |
| <b>#</b>                                                                     | <b>Learning Outcome Description</b>                                                                                                                                                          |
| LO1                                                                          | Critically analyse advanced predictive analytics methodologies in order to assess best practice guidance when applied to complex data mining problems                                        |
| LO2                                                                          | Investigate and evaluate key concepts and advanced predictive analytics techniques and assess when to apply such techniques on complex datasets and practical problem domains.               |
| LO3                                                                          | Contextualise, research and utilise current data approaches, applications and technologies in order to develop predictive analytics strategies to address a variety of real world situations |
| LO4                                                                          | Critically review and apply appropriate data mining research and assess research methods                                                                                                     |
| <b>Dependencies</b>                                                          |                                                                                                                                                                                              |
| <b>Module Recommendations</b>                                                |                                                                                                                                                                                              |
| No recommendations listed                                                    |                                                                                                                                                                                              |
| <b>Co-requisite Modules</b>                                                  |                                                                                                                                                                                              |
| No Co-requisite modules listed                                               |                                                                                                                                                                                              |
| <b>Entry requirements</b>                                                    | A level 8 degree or its equivalent in any discipline                                                                                                                                         |

# H9DAPA: Domain Applications of Predictive Analytics

| Module Content & Assessment                                                                                                                                                                                                                                                                                 |                       |                           |            |
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| <b>Indicative Content</b>                                                                                                                                                                                                                                                                                   |                       |                           |            |
| <b>General Strategies Revisited</b><br>Analytics and Predictive analytics, Big data and predictions, Applying PA, Credit Scores                                                                                                                                                                             |                       |                           |            |
| <b>Deployment</b><br>Business case for PA, domains where it is working, the DARPA challenge, Advertisement options                                                                                                                                                                                          |                       |                           |            |
| <b>Ethics</b><br>Ethical issues of marketing analytics, HR analytics, Data aggregation and selling, Civil Rights and Big data, Predictive Policing                                                                                                                                                          |                       |                           |            |
| <b>Data</b><br>Using Social media data, Insights from Consumer Behaviour, Financial Data, Healthcare etc., p-value, Importance of business meaning                                                                                                                                                          |                       |                           |            |
| <b>Modelling 1</b><br>Predictive modelling methods, Decision Trees, Overlearning                                                                                                                                                                                                                            |                       |                           |            |
| <b>Modelling 2</b><br>Classification and Regression trees                                                                                                                                                                                                                                                   |                       |                           |            |
| <b>Ensembles 1</b><br>Meta-learning, Recommender systems, Kaggle and Crowdsourcing                                                                                                                                                                                                                          |                       |                           |            |
| <b>Ensembles 2</b><br>Bagging, Improvement gains, Generalisations                                                                                                                                                                                                                                           |                       |                           |            |
| <b>QA 1</b><br>QA systems, Natural Language Processing, Structured Data, Unstructured Collections                                                                                                                                                                                                           |                       |                           |            |
| <b>QA 2</b><br>IBM Watson – history, now it works, applications in different domains                                                                                                                                                                                                                        |                       |                           |            |
| <b>Uplift 1</b><br>Persuasion modelling, Incremental modelling, Uplift decision trees                                                                                                                                                                                                                       |                       |                           |            |
| <b>Uplift 2</b><br>Applications – Upsell, Cross-sell, Customer Retention                                                                                                                                                                                                                                    |                       |                           |            |
| <b>Assessment Breakdown</b>                                                                                                                                                                                                                                                                                 |                       |                           | <b>%</b>   |
| Coursework                                                                                                                                                                                                                                                                                                  |                       |                           | 100.00%    |
| <b>Assessments</b>                                                                                                                                                                                                                                                                                          |                       |                           |            |
| Full Time                                                                                                                                                                                                                                                                                                   |                       |                           |            |
| <b>Coursework</b>                                                                                                                                                                                                                                                                                           |                       |                           |            |
| <b>Assessment Type:</b>                                                                                                                                                                                                                                                                                     | Formative Assessment  | <b>% of total:</b>        | Non-Marked |
| <b>Assessment Date:</b>                                                                                                                                                                                                                                                                                     | n/a                   | <b>Outcome addressed:</b> | 1,2,3,4    |
| <b>Non-Marked:</b>                                                                                                                                                                                                                                                                                          | Yes                   |                           |            |
| <b>Assessment Description:</b><br>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. |                       |                           |            |
| <b>Assessment Type:</b>                                                                                                                                                                                                                                                                                     | Formative Assessment  | <b>% of total:</b>        | Non-Marked |
| <b>Assessment Date:</b>                                                                                                                                                                                                                                                                                     | n/a                   | <b>Outcome addressed:</b> | 1,2,3,4    |
| <b>Non-Marked:</b>                                                                                                                                                                                                                                                                                          | Yes                   |                           |            |
| <b>Assessment Description:</b><br>Project proposal                                                                                                                                                                                                                                                          |                       |                           |            |
| <b>Assessment Type:</b>                                                                                                                                                                                                                                                                                     | Continuous Assessment | <b>% of total:</b>        | 40         |
| <b>Assessment Date:</b>                                                                                                                                                                                                                                                                                     | n/a                   | <b>Outcome addressed:</b> | 1,2,3,4    |
| <b>Non-Marked:</b>                                                                                                                                                                                                                                                                                          | No                    |                           |            |
| <b>Assessment Description:</b><br>Project Design                                                                                                                                                                                                                                                            |                       |                           |            |
| <b>Assessment Type:</b>                                                                                                                                                                                                                                                                                     | Continuous Assessment | <b>% of total:</b>        | 60         |
| <b>Assessment Date:</b>                                                                                                                                                                                                                                                                                     | n/a                   | <b>Outcome addressed:</b> | 1,2,3,4    |
| <b>Non-Marked:</b>                                                                                                                                                                                                                                                                                          | No                    |                           |            |
| <b>Assessment Description:</b><br>Project Report and Presentation                                                                                                                                                                                                                                           |                       |                           |            |
| No End of Module Assessment                                                                                                                                                                                                                                                                                 |                       |                           |            |
| No Workplace Assessment                                                                                                                                                                                                                                                                                     |                       |                           |            |
| Reassessment Requirement                                                                                                                                                                                                                                                                                    |                       |                           |            |
| <b>Coursework Only</b><br>This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.                                                                                                                                                                 |                       |                           |            |
| <b>Reassessment Description</b><br>The repeat strategy for this module is by repeat assessment/project that covers all learning outcomes.                                                                                                                                                                   |                       |                           |            |

## H9DAPA: Domain Applications of Predictive Analytics

| Module Workload                      |                                    |       |            |                                 |
|--------------------------------------|------------------------------------|-------|------------|---------------------------------|
| Module Target Workload Hours 0 Hours |                                    |       |            |                                 |
| Workload: Full Time                  |                                    |       |            |                                 |
| Workload Type                        | Workload Description               | Hours | Frequency  | Average Weekly Learner Workload |
| Lecture                              | Classroom & Demonstrations (hours) | 24    | Every Week | 24.00                           |
| Tutorial                             | Other hours (Practical/Tutorial)   | 12    | Every Week | 12.00                           |
| Independent Learning                 | Independent learning (hours)       | 89    | Every Week | 89.00                           |
| Total Weekly Contact Hours           |                                    |       |            | 36.00                           |

| Module Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
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| <i>Recommended Book Resources</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Siegel, E.. (2016), Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die, Wiley Press.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| <i>Supplementary Book Resources</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| <p>Dean Abbott, Applied Predictive Analytics: Principle and Techniques for the Professional Data Analyst (Wiley, 2014)..</p> <p>John W. Foreman, Data Smart: Using Data Science to Transform Information into Insight (Wiley, 2013)..</p> <p>Gordon S. Linoff and Michael J. A. Berry, Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management (Wiley, 2011).</p> <p>Anasse Bari, Mohamed Chaouchi, and Tommy Jung, Predictive Analytics For Dummies (For Dummies, a Wiley Brand, 2014).</p> <p>Jeffrey Strickland, Predictive Modeling and Analytics (lulu.com, 2014)..</p> <p>Vijay Kotu and Bala Deshpande, Predictive Analytics and Data Mining: Concepts and Practice with RapidMiner (Morgan Kaufmann, 2014).</p> <p>John D. Kelleher, Brian Mac Namee, and Aoife D'Arcy, Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked Examples, and Case Studies (The MIT Press, 2015)..</p> |  |
| <i>This module does not have any article/paper resources</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
| <i>Other Resources</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| <p>[Website], The Predictive Analytics Guide—articles, industry portals, and other resources; <a href="http://www.pawcon.com/guide">http://www.pawcon.com/guide</a></p> <p>[Website], The Predictive Analytics Times—industry news, technical articles, videos, events, and community; <a href="http://www.predictiveanalyticstimes.com">http://www.predictiveanalyticstimes.com</a></p> <p>[Website], The Prediction Book, <a href="http://www.thepredictionbook.com">http://www.thepredictionbook.com</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Discussion Note:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |