Amrita School of Business
Amrita Vishwa Vidyapeetham
Coimbatore

Term IV (25 Jun 2018 – 25 Sep 2018)

Course Title:	**Business Analytics**
Course Code:	BA001E
Credits:	3
Total Sessions:	24
Course Instructor:	**Dr. Shyam A V.**
Contact Information:	av_shyam@cb.amrita.edu
Office:	F-14
Office hours:	Tuesdays & Thursdays Friday 2:30 – 4:30 pm (On other days with prior appointment)
Course contributes mostly to:	**Employability/** Entrepreneurship/ **Skill Development**/ Value-add

Course Description

The proliferation of Information Technology tools in organizations has not only created new opportunities, but also is posing newer challenges. For instance a major challenge for managers is no longer the collection of data but analysis of the vast amounts of data that are available. The availability of low-cost massive data storage technologies and Internet connections have made available large amounts of data that have been collected and accumulated by the various organizations over the years. The challenge is how to make use of the available data to make better decisions. The organizations that can do this better stand to gain. The demand for managers with such skills is also high.

Business Analytics helps managers to leverage value from data. Business Analytics is an umbrella term that subsumes technologies, applications and practices for the collection, integration, storage, access, analysis, and presentation of business information to help users make better decisions. Business Analytics can give competitive advantage to organisations – but there are a lot of factors that contribute to successful implementation of analytics in an organisation.

Course Objectives

This course builds on the first year core course 'Introduction to Business Analytics" and seeks to:

1. Develop skills in using data for supporting business decisions.

The course also covers

2. An introduction to the topics of data visualization, data warehousing and data mining.
3. Usage of tools and techniques for classification and prediction systems in a variety of functional disciplines.
4. Methods to pre-process the data before beginning to apply any of the tools that are available.
5. Conceptual details of the data mining methods discussed
6. Steps in the usage of tools
7. Interpretation of results of data mining

The program level Assurance of Learning (AoL) goal that this course seeks to contribute to is critical and integrative thinking.

Alignment of course objectives (CO) with learning goals (LG) of Assurance of Learning

Derived from its mission, ASB has adopted five learning goals, (apart from the discipline competency) - the management-specific attributes, knowledge and skills that its graduates are expected to possess when they complete the programme.

LG / CO	Critical and integrative Thinking	Effective written and oral communication	Societal and Environmental Awareness	Ethical Reasoning	Leadership
CO1	3	0	0	0	0
CO2	2	0	0	0	0
CO3	2	0	0	0	0
CO4	2	0	0	0	0
CO5	1	0	0	0	0
CO6	1	0	0	0	0
CO7	3	1	0	0	0

Key: 3 – Highly relevant; 2 –Moderately relevant; 1 – Low relevance; 0- No relevance

Mapping of course outcomes and Bloom's taxonomy

Bloom's Levels of Learning	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6	CO 7
Creating							
Evaluating	X		X				X
Analyzing	X		X			X	X
Applying	X	X	X	X		X	X
Understanding	X	X	X	X	X	X	X
Remembering	X	X	X	X	X	X	X

Pedagogy

The focus will be on application rather than the theory behind the methods underlying the tool. However, since the application of any tool cannot happen in a vacuum, necessary inputs on the features of the underlying analysis method will be provided in class. The necessary inputs for using the tools will be provided. Short videos will be used in several sessions to reinforce the concepts discussed. Some journal articles will be prescribed for reading in certain sessions. We will use Microsoft Excel and R to accomplish various tasks. We will be using an open source tool named Weka to do the data mining tasks. We will tackle problems in class together. So you must bring your laptops to class from session number 7 onwards.

Assessment (Grading Policy: Relative)

S. no	Assessment exercise	Description	Weight
Group assessment (20%)			
1	Term paper (in groups of 2 members)	*The students have to choose one particular domain in analytics, do a literature review of at least 20 journal articles (from journals rated B or above in the latest ABDC journal rankings), collect a publically available data set relevant to the above, do an analysis applying the methods learned in the course, and report the findings*	20%
Individual Assessment (80%)			
1	Attendance	*Expected attendance, as per the rules*	5%
2	3 quizzes	*Checking conceptual understanding*	3 * 10% = 30%
3	Class participation	*How the student contributes to the discussion in class*	10%
4	End-term examination	*A closed book comprehensive exam checking the understanding of the topics covered in the course – both conceptual and practical. About eighty percent of the questions will require the students to use the tool and apply the techniques learned in the course to answer the questions.*	35%

Course Requirements

Prerequisites for the course: All of you have taken the core courses 'Introduction to Business Analytics', 'Data Analytics I' and 'Data Analytics II'. The only other prerequisite is a strong desire to learn the concepts and tools covered in this course so as to become a manager with better data analytics and decision making skills. No programming background is required for this course.

The students are expected to attend all the sessions and actively participate in the discussions. Timely completion and submission of all assignments is compulsory. Late submissions will not be evaluated. The students are expected to come to the class on time, and after revising the topics already covered. Students are expected to abide by the strictest standards of academic integrity and ethics

Course Materials

There is no prescribed textbook for this course. A list of references is given at the end. Relevant journal articles will be discussed in some sessions.

Session Plan

Session numbers	Topics
1	Introduction to the course, Review of concepts covered in IBA course
2 & 3	Review of Linear Regression & Multiple regression
4	Tackling the problem of Multicollinearity; Use of dummy variables in regression
5 & 6	Logistic regression
7	OLTP vs OLAP, Data warehousing fundamentals, dimension tables and fact tables, schemas (star, snowflake, galaxy)
8	Multidimensional analysis, OLAP architectures (ROLAP, MOLAP)
9	Multidimensional analysis – pivoting, use of pivot tables, data pre-processing, hands on practice
10	Data warehouses – characteristics and goals, different approaches to build data warehouses, Datawarehousing – Extraction, Transformation and Loading
11	Introduction to data mining, success stories
12	Different learning schemes in data mining applications
13	Introduction to Weka, arff file format
14	Introduction to classification using Weka
15	Filtering techniques
16	Test options – difference between various options
17	Classification algorithms – ZeroR and OneR, Discretization, overfitting
18	Naive Bayes algorithm, zero frequency problem, tackling missing values
19	Decision trees, constructing and visualising decision trees, J48 algorithm, computing information gain, concept of entropy, Gini impurity index
20	Random Forest algorithm
21	Ensemble methods
22	Mining association rules, concepts of support and confidence, the apriori algorithm
23	Clustering techniques (hierarchical and non-hierarchical)
24	Course wrap-up

Indicative list of References

Baesens, Bart. 2014. ***Analytics in a big data world – The essential guide to data science and its applications.*** New Delhi: Wiley India Pvt Ltd.

Davenport, Thomas. H**.** & Harris, Jeanne. G. 2007. ***Competing on Analytics: The New Science of Winning***. USA: Harvard Business School Press.

Kumar, Dinesh. U. 2017. ***Business Analytics: The science of data-driven decision making***. New Delhi. Wiley India Pvt Ltd.

Laursen, Gert. H. N., & Thorlund, Jesper. 2010. ***Business analytics for managers: Taking business intelligence beyond reporting***. USA: John Wiley and Sons Inc.

Provost, Foster., & Fawcett, Tom. 2013. ***Data science for business – What you need to know about data mining and data-analytic thinking***. USA: O'Reilly Media Inc.

Rud, Olivia. Par. 2009. ***Business intelligence success factors – Tools for aligning your business in the global economy***. USA: John Wiley and Sons Inc.

Soman, K. P., Diwakar, Shyam., & Ajay, V. 2006. ***Insight into data mining theory and practice***. India: Prentice Hall of India Pvt Ltd.

Vercellis, Carlo. 2009. ***Business Intelligence: Data mining and optimization for decision making***. UK: John Wiley and Sons Ltd.

Williams, Steve., & Williams, Nancy. 2007. ***The profit impact of business intelligence***. USA: Morgan Kaufmann.

Witten, Ian. H., Frank, Eibe., & Hall, Mark. A. 2011. ***Data mining: Practical machine learning tools and techniques***. USA: Morgan Kaufmann.

Contribution to Placements

The knowledge and understanding gained from this course make explicit contributions to success during the placement process (especially in tests and interviews). The term paper component which involves collection of relevant journal articles and application of methods learned will enhance the critical and integrative thinking skills as well as the written communication skills that will be helpful in placements.

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