Title (Units): **GFQR1026 Big Data in "X" (3,1,2)**

Course Aims: This course aims to give students an overview of the global trend of big data analytics and how big data analytics can be used in various disciplines, including Art, Humanities & Religion, Language & Education; Business; Communication & Media; Science & Medical; Social Science, etc. This course adopts a case-study-based approach. Students will learn big data analytics applications, and their values and influence in various disciplines through case studies. This course also encourages students to exchange their views from different disciplines through Interdisciplinary Group Discussions. Discussion topics will be like, "how disease risk prediction (big data analytics in Science & Medical) can improve related social policy (views from Social Science)?" On the practical side, students will acquire basic analytic, computational and software skills as well as gain hands-on experience in analyzing, interpreting, critiquing, visualizing and drawing conclusions from quantitative data in the context of various disciplines. After completing this course, students will develop the capability to evaluate the benefits and threats of big data analytics from an interdisciplinary perspective, and at the same time be able to apply generic quantitative methods together with computational and software skills to solve discipline-specific problems.

Prerequisite: Nil

Course Intended Learning Outcomes (CILOs):
Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Describe the needs, usage, importance and impact of big data analytics in various disciplines.
2	Analyse and draw conclusions from quantitative data in the context of various disciplines.
	Skill
3	Apply basic analytic and computational skills to problems in various disciplines.

Calendar Description: This course aims to give students an overview of the global trend of big data analytics and how big data analytics can be used in various disciplines. Students will learn big data analytics applications, and their values and influence in various disciplines through case studies. This course also encourages students to exchange their views from different disciplines through Interdisciplinary Group Discussions. On the practical side, students will acquire basic analytic, computational and software skills as well as gain hands-on experience in analyzing, interpreting, critiquing, visualizing and drawing conclusions from quantitative data in the context of various disciplines. After completing this course, students will develop the capability to evaluate the benefits and threats of big data analytics from an interdisciplinary perspective, and at the same time be able to apply generic quantitative methods together with computational and software skills to solve discipline-specific problems.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1	Lectures will be given to introduce different big data analytic examples in various disciplines (basic background of each specific discipline will be reviewed in prior to the examples). Students will learn about the usage/application and skills of big data analytics in each example/discipline.
1	Case Study Tutorials will be used to help students apply various computational and software skills learned in labs to analyze large datasets in various disciplines to uncover information that can help organizations make informed decisions.
1	Interdisciplinary Group Discussions will inspire students how big data analytics applied to one discipline could also find applicability in other discipline(s). Students from different

	disciplines will be grouped together so that students will have interdisciplinary discussions to share views from different disciplines.
2 - 3	Labs will be given to teach students various computational and software skills to perform data analytics so as to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data in the context of various disciplines.
2 - 3	Hands-on exercises will be given to students to practise the acquired skills to solve real-life problems and workplace-specific problems in various disciplines.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Case Study Tutorial Exercises	20%	1-2	Case Study Tutorial Exercises are used to test if students can apply various computational and software skills learned in labs to real cases. In each exercise, students will be given a/some large dataset(s) and asked to uncover information that can help to make informed decisions.
2	Group Project & Presentation	30%	1-3	Group project is used to test how well students understand and apply the concepts and skills to perform analysis on cases. Students will form groups to examine large and varied data sets to gain insights or draw conclusions about what they contain, such as hidden patterns, unknown correlations, market trends and customer preferences.
3	Lab Exercises	20%	2 - 3	Lab Exercises are used to test whether students acquire the computational and software skills.
4	Practical Test	15%	2 - 3	Practical Test is used to evaluate how well students acquire the computational and software skills and apply the skills to solve discipline-specific problems.
5	Quiz	15%	1	The quiz is designed to determine to what extent the students have achieved the expected learning outcome.

Assessment Rubrics:

Excellent (A)	• Demonstrate thorough knowledge and understanding of the needs, usage, importance and impact of big data analytics in various disciplines. • Fully able to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data in the context of various disciplines. • Able to apply basic analytic and computational skills to problems in various disciplines with a high degree of effectiveness.
Good (B)	• Demonstrate sufficient knowledge and understanding of the needs, usage, importance and impact of big data analytics in various disciplines. • Able to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data in the context of various disciplines. • Able to apply basic analytic and computational skills to problems in various disciplines with a considerable degree of effectiveness.
Satisfactory (C)	• Demonstrate some knowledge and understanding of the needs, usage, importance and impact of big data analytics in various disciplines. • Able to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data in some disciplines / common scenarios.

	• Able to apply basic analytic and computational skills to problems in various disciplines with some degree of effectiveness. • Demonstrate limited knowledge and understanding of the needs, usage, importance and impact of big data analytics in various disciplines.
Marginal Pass (D)	• Able to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data in limited disciplines / scenarios. • Able to apply basic analytic and computational skills to problems in various disciplines with a moderate degree of effectiveness. • Demonstrate little or no knowledge and understanding of the needs, usage, importance and impact of big data analytics in various disciplines.
Fail (F)	• Unable to understand, analyse, interpret, critique, visualize and draw conclusions from quantitative data. • Unable to apply basic analytic and computational skills.

Course Content and CILOs Mapping:

Content		CILO No.
I	Data analytics (methodologies, examples and impacts) in various disciplines	1 - 2
II	Analytic, computational and software skills in practice, for example:	3

References:

• Thomas H. Davenport, Big Data at Work: Dispelling the Myths, Uncovering the Opportunities, Harvard Business Review Press, 2014.
• Giovanni Schiuma and Daniela Carlucci, Big Data in the Arts and Humanities: Theory and Practice (Data Analytics Applications), Auerbach Publications, 2018.
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• David Taniar and Lukman Hakim Iwan, Exploring Advances in Interdisciplinary Data Mining and Analytics: New Trends, IGI Global, 2011.
• Simon Elias Bibri, Smart Sustainable Cities of the Future: The Untapped Potential of Big Data Analytics and Context–Aware Computing for Advancing Sustainability (The Urban Book Series), Springer, 2018.
• Raghav Bali, Dipanjan Sarkar and Tushar Sharma, Learning Social Media Analytics with R: Transform data from social media platforms into actionable business insights, Packt Publishing, 2017.
• Dr. Gerard M. Verschuuren, 130 Excel Simulations in Action: Simulations to Model Risk, Gambling, Statistics, Monte Carlo Analysis, Science, Business and Finance, CreateSpace Publishing, 2017.
• Thomas J. Quirk, Excel 2019 for Social Science Statistics: A Guide to Solving Practical Problems (Excel for Statistics), Springer, 2021.
• Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presending Data, 1st Edition, EMC Education Services, 2015.
• Jones M. Daniel, Data Analytics: 4 Books in 1- Bible of 4 Manuscripts – Beginner's Guide + Tips and Tricks + Effective Strategies + Best Practices to learn Data Analytics Efficiently, CreateSpace Independent Publishing Platform, 2018.

Course Content:

Topic

I. Data analytics (methodologies, examples and impacts) in various disciplines
   1. Art, Humanities & Religion, Language & Education
   2. Business
   3. Communication & Media
   4. Science & Medical
   5. Social Science

II. Analytic, computational and software skills in practice, for example:

1. Statistics for language studies and education
2. Business Forecasting
3. Importing and analyzing data from social media or other internet sources
4. Basic scientific simulations
5. Using data analytics to gain insight to environmental, health and safety and sustainability problems