**Bachelor of Science in Data Science and Business Administration**

**BSDSBA 2027**

**School Year 2023-2024**

**Course Outline**

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| **School** | **Aboitiz School of Information, Technology, and Entrepreneurship** |
| **Course Code** | **DVS 2301** |
| **Course Title** | **Data Visualization and Storytelling** |
| **Units** | **3** |
| **Term** | **Year 2 – Semester 2** |

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| **Faculty Name** | **Michelle Banawan** |  |  |
| **Email Address** | [**mbanawan@aim.edu**](mailto:mbanawan@aim.edu) |  |  |
| **Consultation Hours** | **F 2:00 – 4:00 PM** |  |  |

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| **Program Staff** | **Nicholas Paredes** |
| **Email Address** | [**nparedes@aim.edu**](mailto:nparedes@aim.edu) |
| **Extension No.** | **3027** |

**A. Course Description**

**In this course, students will learn the importance of effective data visualizations and intelligible data-driven stories in creating actionable insights. Using real-world datasets and case studies, students will assimilate the necessary skills to fashion effective visualizations that exhibit not only good design elements but also layers of information that when weaved together as a narrative can generate actionable insights and new levels of understanding.**

**The course will introduce students to make use of Python plotting and other data visualization and data analytics platforms. They will be tasked to build data visualization artifacts and dashboards. At the end of this course, students should be knowledgeable about the fundamentals of data exploration and analysis and should be ready to gain deeper expertise in data visualization and storytelling.**

**This course is heavy on hands-on exercises as students are expected to learn by doing.**

***Note: Content of the course outline is subject to change.***

**B. Pre-requisites**

* **General Intro to Programming, PROG 1301**
* **Business Computer Apps, BCIS 1305**
* **Business Statistics, BUSI 2305**

**C. Course Learning Outcomes  
At the end of the course, students will be able to:**

1. **Apply critical thinking and data-driven approaches to decision-making skills**
2. **Handle and present real-world datasets from the various sources in the most accurate and effective way to drive actionable insights across sectors**
3. **Quantify relationships within datasets**
4. **Describe the elements of good data visualization and data stories**
5. **Visualize data with different tools and software that are striking, comprehensible to a general audience, and that suggest patterns, relationships, or stories**
6. **Build data visualization and tell data-driven stories**
7. **Compare with different tools and software that can be used to produce good data visualizations.**

**D. Course Contribution to Program Learning Goals and Objectives**

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| **Course Learning Outcomes** | **Program Learning Goals/Objectives** |

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| **1-7** | 1. **Students will be proficient in communicating business value.** |
| **1-7** | 1. **Students will be adept in data science tools and platforms.** |
| **2,3,5,6,7** | 1. **Students will be critical and highly skilled in programming languages and big data analysis.** |
| **1-7** | 1. **Students will be informed decision-makers and implementors who can work with teams.** |

**E. Learning Methodology**

* **Individual/group projects**
* **Class participation**
* **Group discussions**
* **Homework, Quizzes, and Exams**
* **Course deliverables to be submitted in ALICE**
* **Policy on Late Submissions**
  + **All requirements must be submitted within the deadlines specified in ALICE**

**F. Grading Criteria**

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| ***Criteria*** | **Weight** |
| **Participation in class discussions, and ALICE discussion boards** | **20** |
| **Hands-on exercises, homework, quizzes, and exams**  ***15% individual exercises, homework/notebooks, quizzes, and exams***  ***15% group exercises, notebooks and homework***  ***5% peer evaluation for group submissions*** | **40** |
| **Projects**  ***15% individual projects (e.g. storyboards)***  ***20% group exercises (e.g. journal scan, dashboard)***  ***5% Peer Evaluation*** | **40** |
| **Total** | **100%** |

***\*Final Grades automatically calculated in the ALICE Grade Center are not conclusive and are subject to Program Deliberations of the Faculty at the end of the Program Term***

**G. Student Responsibilities and Conduct**

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| **G. Student  Responsibilities and Conduct** |
| **Students are expected to conduct themselves with the utmost professionalism in all classes.  Information and policies on student responsibilities and conduct, including dysfunctional behavior (such as attendance, plagiarism, cheating, etc) and grievance procedures are in the Student Handbook.** |
| ***G.1. Acceptable use of AI***  **The use of AI is acceptable for some of the coursework. However, without explicit instructions, students should NOT use AI in course deliverables submitted for credit (graded course deliverables), most especially for all quizzes and exams. Unsanctioned use of AI will get an automatic grade of zero and the corresponding incident report will be submitted to the Program.** |
| ***G.2. Cheating and Academic Misconduct as Dysfunctional Behavior***  **Definition of Cheating on Exams:**  **Cheating on exams includes, but is not limited to:**   * **Copying answers from another student or allowing another student to copy your answers during an exam.** * **Communicating with others during an exam using any means (e.g., talking, signaling, text messaging, or electronic devices).** * **Using unauthorized materials or devices during an exam (e.g., notes, calculators, phones, or smartwatches).** * **Accessing or attempting to access another student's work during the exam, either physically or digitally.** * **Using AI tools, bots, browser extensions, or similar technologies to obtain answers or aid performance during exams**   **Definition of Homework Misconduct**  **Misconduct related to homework includes:**   * **Sharing your completed homework, project, or solution with another student, whether knowingly or negligently, unless explicitly allowed by the instructor.** * **Allowing another student to copy your work, either in part or in full.** * **Submitting another student’s work as your own or enabling them to submit yours.** * **Collaborating on individual assignments without instructor approval.** * **Using AI tools, bots, browser extensions, or similar technologies to complete homework or assignments without explicit permission.**   **Prohibited Use of AI Tools, Bots, and Browser Extensions**  **The use of any unauthorized software, tools, or technologies that automate or aid in completing academic work is strictly prohibited. This includes, but is not limited to:**   * **ChatGPT, Copilot, or any other AI-based text, code, or answer generators.** * **Automating responses through a script or a bot, copying content, or bypassing academic platforms.** * **Tools (like browser extensions, etc.) designed to autocomplete or generate exam answers, bypass monitoring systems, or provide unauthorized assistance during assessments.**   **Shared Responsibility**  **Students are expected to:**   * **Protect their work and avoid sharing access to their accounts or devices.** * **Ensure that no unauthorized software or extensions are installed on devices used for academic purposes.** * **Report any observed misuse of technology by peers.**   **The institution is committed to creating a fair and equitable academic environment. Students are expected to:**   * **Take responsibility for their own learning and performance.** * **Respect the integrity of the academic community by avoiding any forms of misconduct.** |

**H. Course Schedule**

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| Session Number | Session Topic (in-session) | Pre-session Activity | Faculty/Resource Speaker | Learning or Case Materials | Supplementary Readings | Assessment activities | Requirements or Submissions | Post-session Activity |
| Sessions 1-2  January 13 & 16, 2025  1:30 – 3:00 PM | Introduction to Data Visualization and Storytelling | Read: How to Lie with Statistics. Huff, D. (2010). How to lie with statistics. WW Norton & company. | **Prof. Michelle Banawan, PhD** | Foundations of Data Visualization and Storytelling Camm, Cochran, Fry Ohlmann, Data Visualization - Exploring and Explaining with Data, 1st Edition, © 2021 Cengage, 978-035-763-1348; Chapter 1: Introduction |  | Assignment: What are your insights on "How to Lie with Statistics"? | Insights/Reflection due:EOD |  |
| Session 3-4  January 20 & 23, 2025  1:30 – 3:00 PM | Introduction to Data Visualization and Storytelling | Read: How to Lie with Statistics. Huff, D. (2010). How to lie with statistics. WW Norton & company. | **Prof. Michelle Banawan, PhD** | Foundations of Data Visualization and Storytelling Camm, Cochran, Fry Ohlmann, Data Visualization - Exploring and Explaining with Data, 1st Edition, © 2021 Cengage, 978-035-763-1348; Chapter 1: Introduction |  | Assignment: What are your insights on "How to Lie with Statistics"? | Insights/Reflection due:EOD |  |
| Session 5-6  January 27 & 30, 2025  1:30 – 3:00 PM | Overview of different types of Data Analytics and their applications | Read the “5 Essential Principles  for Understanding Analytics” by  Thomas H. Davenport.  Visualizations That Really Work  by Scott Berinato  How to Make Sure You’re Not  Using Data to Justify Decisions  You’ve Already Made by Kevin  Troyanos  https://hbr.org/2018/10/how-  tomake-sure-youre-not-  usingdata-just-to-justify-  decisionsyouve-already-made | **Prof. Michelle Banawan, PhD** | Data Visualization and Storytelling  Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 2: Selecting a Chart Type;  Chapter 3: Data Visualization and  Design |  | Quiz 1 | Hands-on Exercises |  |
| Session 7-8  February 3 & 6, 2025  1:30 – 3:00 PM | Overview of different types of Data Analytics and their applications | Read the “5 Essential Principles  for Understanding Analytics” by  Thomas H. Davenport.  Visualizations That Really Work  by Scott Berinato  How to Make Sure You’re Not  Using Data to Justify Decisions  You’ve Already Made by Kevin  Troyanos  https://hbr.org/2018/10/how-  tomake-sure-youre-not-  usingdata-just-to-justify-  decisionsyouve-already-made | **Prof. Michelle Banawan, PhD** | Data Visualization and Storytelling  Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 2: Selecting a Chart Type;  Chapter 3: Data Visualization and  Design |  | Quiz 1 | Hands-on Exercises |  |
| Session 9-10  February 10 & 13, 2025  1:30 – 3:00 PM | Design Principles of Data Visualization |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 4: Purposeful Use of Color,  Chapter 5: Visualizing Variability |  | Quiz 2 | Hands-on Exercises |  |
| Session 11-12  February 17 & 20, 2025  1:30 – 3:00 PM | Design Principles of Data Visualization |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 4: Purposeful Use of Color,  Chapter 5: Visualizing Variability |  | Quiz 2 | Hands-on Exercises |  |
| Session 13-14  February 24 & 27, 2025  1:30 – 3:00 PM | Design Principles of Data Visualization |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 4: Purposeful Use of Color,  Chapter 5: Visualizing Variability |  | Quiz 2 | Hands-on Exercises |  |
| Session 15-16  March 3 & 6, 2025  1:30 – 3:00 PM | **Midterm Exam** |  | **Prof. Michelle Banawan, PhD** |  |  |  |  |  |
| Session 17-18  March 10 & 13, 2025  1:30 – 3:00 PM | Design Principles of Data Visualization |  | **Prof. Michelle Banawan, PhD** | Don Norman's Design of Everyday Things |  | Homework and LT presentation | Homework - Individual - Design Flaw (Instructions to be announced in class); LT presentation - Group - Everyday Thing - Each group will be assigned a Design Principle (e.g. Affordance, Visibility, Signifiers, etc. |  |
| Session 19-20  March 17 & 20, 2025  1:30 – 3:00 PM | Design Principles of Data Visualization |  | **Prof. Michelle Banawan, PhD** | Don Norman's Design of Everyday Things |  | Homework and LT presentation | Homework - Individual - Design Flaw (Instructions to be announced in class); LT presentation - Group - Everyday Thing - Each group will be assigned a Design Principle (e.g. Affordance, Visibility, Signifiers, etc. |  |
| Session 21-22  March 24 & 27, 2025  1:30 – 3:00 PM | Handling Data |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 9: Telling the Truth with Data |  | Quiz 3 |  |  |
| Session 23-24  April 3 & 7, 2025  1:30 – 3:00 PM | Handling Data |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 9: Telling the Truth with Data |  | Quiz 3 |  |  |
| Session 25-26  April 10 & 14, 2025  1:30 – 3:00 PM | Explaining Visually through Data |  | **Prof. Michelle Banawan, PhD** | Camm, Cochran, Fry Ohlmann,  Data Visualization - Exploring and  Explaining with Data, 1st Edition, ©  2021 Cengage, 978-035-763-1348;  Chapter 7: Explaining Visually Through Data |  | Quiz 4  And Hands-on Exercises |  |  |
| Session 27-28  April 21 & 24, 2025  1:30 – 3:00 PM | Data Storytelling |  | **Prof. Michelle Banawan, PhD** | Storytelling Frameworks |  | LT presentation on storytelling |  |  |
| Session 29-30  April 28 & May 5, 2025  1:30 – 3:00 PM | Final Exam |  | **Prof. Michelle Banawan, PhD** |  |  | Final Exam | Peer Evaluation |  |

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| **References** |
| 1. Camm, Cochran, Fry Ohlmann, Data Visualization - Exploring and Explaining with Data, 1st Edition, ©2021 Cengage, 978-035-763-1348; (Textbook) 2. Huff, D. (2010). How to lie with statistics. WW Norton & company. (Available in the internet). 3. Don Norman’s Design of Everyday Things. (Available in the internet). 4. <https://seaborn.pydata.org/tutorial.html> |