**1. Course and Instructor Information**

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| **College :** | **College of Science** |
| **Department :** | **Information Technology & Information Systems Department** |
| **Course Title :** | **Analytics Techniques and Tools with Application** |
| **Course Code :** | **IS BA 104** |
| **Pre-Requisite :** | **NONE** |
| **Co-Requisite :** | **NONE** |
| **Credit Units :** | **3 Unit Lecture / 3 Hours per Week** |
| **Instructor :** | **Mr. Gene Justine P. Rosales**  **Ms. Maria Jasmin I. Villanueva** |

**2. Course Description**

This course aims to expose the students to the best practices and cutting-edge technologies which are used for transforming business data into useful information. These challenges many organizations is processing large amounts of data as quickly and as efficiently as possible to create reliable analytical models and generate reports in a fast-moving economy. The three phases of the analytics life cycle are ***data***, ***discovery***, and ***deployment***. Data are the foundation of everything you do, discovery is the act of finding something that you had not known before, and deployment is where you get the value out of analytics. Recognizing and fully supporting all three is necessary to generate impactful insights that come from transforming data into value.

1. **Course Outcomes (CO) and Relationship to Student Outcomes (SO) & Institutional Graduate Outcomes (IGO)**

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| **Course Outcomes** | **Student Outcomes** | **Institutional Graduate Outcomes** |
| CO1. Illustrate and apply the theories, concepts, methods and models of business analytics. | a. Apply knowledge of business processes, computing, mathematics and social sciences appropriate to Information Systems. | **IGO No. (1)** Generate ideas, plans and multiple perspective in various field to solve current needs and issues of society with preference for the socially disadvantaged. |
| b. Analyze a problem, identify and define the computing requirements with respect to organizational factors appropriate to its solution and plan strategies for their solution. | **IGO No. (2)** Utilize appropriate technologies, methods and techniques to provide practical and innovative solutions that achieve their intended purpose. |
| CO2. Compare different analytical methods and choose the appropriate ones based on organizational constraints to support business decision-making. | c. Evaluate information systems in terms of general quality attributes and possible trade-offs presented within the given requirement. |
| d. Design, implement, and evaluate information systems, processes, components, or programs and to source cost-benefit efficient alternatives to meet desired needs, goals and constraints. |
| CO3. Propose a plan for basic business analytic methods to address various problems or opportunities. | e. Use knowledge and understanding to enterprises in modeling and design of information systems. | **IGO No. (5)** Make decisions and courses of actions by integrating concepts, theories, practical approaches based on Christian principles. |

**4. Course Outcome-Student Outcome Matrix**

|  |  | **STUDENT OUTCOMES** | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **COURSE OUTCOMES** | **Course Intended Learning Outcomes** | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1. Illustrate and apply the theories, concepts, methods and models of business analytics. | CILO 1: Relate business core processes to its Information Technology requirements. | *I* |  |  |  |  |  |  |  |  |  |  |
| CILO 2: Discover the types of digital data and compare the difference between them. | *I* |  |  |  |  |  |  |  |  |  |  |
| CO2. Compare different analytical methods and choose the appropriate ones based on organizational constraints to support business decision-making. | CILO 3: Discover On-Line Transaction Processing, On-Line Analytical Processing and the Data Models for them. |  | *D* |  |  |  |  |  |  |  |  |  |
|  | CILO 4: Discover Descriptive Analytics through the use of statistical methods. |  |  | *E* |  |  |  |  |  |  |  |  |
| CILO 5: Discover Predictive Analytics through modeling and data mining. |  |  | *E* |  |  |  |  |  |  |  |  |
| CILO 6: Discover Prescriptive Analytics through modeling and nonlinear optimization. |  |  | *E* |  |  |  |  |  |  |  |  |
|  | CILO 7: Discover data warehousing and data integration. |  |  |  | *E* |  |  |  |  |  |  |  |
| CILO 8: Discover data mining algorithms. |  |  |  | *E* |  |  |  |  |  |  |  |
|  | CILO 9: Discover data modeling, data modeling techniques and dimensional models. |  |  |  | *E* |  |  |  |  |  |  |  |
| CILO 10: Construct enterprise reports and dashboards. |  |  |  | *E* |  |  |  |  |  |  |  |
| CILO 11: Discover statistics and its role in analytics. |  |  |  | *E* |  |  |  |  |  |  |  |
| CO3. Propose a plan basic business analytic methods to address various problems or opportunities in an organization. | CILO 12: Demonstrate the application of analytics. |  |  |  |  | *D* |  |  |  |  |  |  |
|  | CILO 13: Demonstrate business analytics through the use of a case problem. |  |  |  |  |  |  | *D* |  |  |  |  |

**I** - Introductory, **E** – Enabling, **D** – Demonstrative

1. **Course Output**

As evidence of attaining the above course intended learning outcomes (CILO), the student is required to accomplish and submit the following at the end of the term as part of the student course portfolio:

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| **COURSE OUTCOMES** | **Course Intended Learning Outcomes** | **Required Output** |
| CO1. Illustrate and apply the theories, concepts, methods and models of business analytics | CILO 1 | Quizzes  Preliminary Exam |
| CILO 2 |
| CO2. Compare different analytical methods and choose the appropriate ones based on organizational constraints to support business decision-making | CILO 3 |
| CILO 4 |
| CILO 5 |
| CILO 6 |
| CILO 7 | Quizzes  Midterm Exam |
| CILO 8 |
| CILO 9 |
| CILO 10 |
| CILO 11 | Quizzes  Project Presentation and Documentation  Final Exam |
| CO3. Propose a plan basic business analytic methods to address various problems or opportunities in an organization. | CILO 12 |
|  | CILO 13 |

1. **Rubrics**
2. **Assessment Rubric for Project Presentation**
3. **Learning Plan**

| **Week No.** | **Course Intended Learning Outcome (CILO)** | **Topics** | | **Teaching and Learning Activities** | **Assessment Task** |
| --- | --- | --- | --- | --- | --- |
| 1-2 | CILO 1: | Orientation   1. Course syllabus 2. Grading system | | Lecture: Discussion  Show and Tell  Questioning to Check for Understanding  Practice Problem Exercises  Summarize New Learning in A Graphical Way | Recitation/ Class Participation  Formative Assessment  Research Assignment |
| 1 | Data Management in the Analytics Economy   * SAS Self Service Data Preparation * Overview of SAS Data Preparation * Road Map to Data Preparation |
| 3 | CILO 2: | 2 | Discovering Ingesting, and Exploring Data   * Managing Data Using SAS Data Explorer * Creating Data Source Connections * Importing Data from Caslibs and Files Local to the Browser * Importing Data from Social Media * Importing Esri Geoenrichment and Geocode Data | Lecture: Discussion  Show and Tell  Nurture Meta-Cognition in the types of Digital Data | Research Assignment  Recitation/ Class Participation  Extended Learning Activities |
| 4 | CILO 3: | 3 | Importing Esri Geoenrichment and Geocode Data   * Introduction to SAS Data Studio and Plans * Preparing Data Using Column Transforms * Using Custom Code to Transform and Aggregate Data * Cleansing Data Using Data Quality Transforms * Blending Data Using Multi-input Transforms * Restructuring and Filtering Data Using Row Transforms | Lecture: Discussion  Show and Tell  Practice Problem Exercises  Distance Learning using the AdU-LMS  Summarize New Learning in A Graphical Way | Research Assignment  Recitation/ Class Participation  Formative Assessment  Extended Learning Activities |
| 5 | CILO 4: | 4 | Understanding and Governing Data and Data Jobs   * SAS Viya and Self-Service Data Preparation * Overview of SAS Data Preparation * Roadmap for Self-Service Data Preparation | Lecture: Discussion  Show and Tell | Recitation/ Class Participation  Individual Case Study  Summative Assessment |
| 6 | CILO 5: | 5 | Introduction to SAS® Visual Data Mining and Machine Learning   * Data Overview and Data Exploration   Machine Learning Algorithms   * Machine Learning and its Applications * Data Partitioning assessment * Neutral Network Diagram | Lecture: Discussion  Show and Tell | Extended Learning Activities  Individual Case Study  **Preliminary Examination** |
|  | | | | | |
| 7 | CILO 6: | 6 | Data partitioning and honest assessment   * Model Comparison Results: Assessment Plots * Scoring New Data * Transferring a SAS Visual Analytics Model to Model Studio * Factorization Machine | Lecture: Discussion  Show and Tell  Distance Learning using the AdU-LMS | Research Assignment  Recitation/ Class Participation  Individual Case Study |
| 8 -9 | CILO 7: | 7 | FORECASTING  Introduction and Data Visualization   * Creating a Forecasting Project and Loading the Data * Visualizing the Modeling Data Using Attribute Variables | Lecture: Discussion  Show and Tell  Students Working Together in productive ways  Summarize New Learning in A Graphical Way | Research Assignment  Recitation/ Class Participation  Productive Group Work  Formative Assessment |
| 10 | CILO 8: | 8 | Pipeline Essentials  - Definition and Creation of Time Series  - Fundamental Concept in Time Series Modeling  - Classes of Series Models  Post Forecasting Functionality | Lecture: Discussion  Show and Tell  Applications in Forecasting | Recitation/ Class Participation  Summative Assessment |
| 11 | CILO 9: | 9 | VISUAL ANALYTICS  Introduction to SAS® Visual Text Analytics   * Overview of SAS Text Analytics * high level the function of SAS Visual Text Analytics | Lecture: Discussion  Show and Tell | Research Assignment  Recitation/ Class Participation  Extended Learning Activities |
| 12 | CILO 10: | 10 | SAS® Visual Text Analytics Demonstrations   * Importing Document Collections * Creating a Project with No Predefined Concepts   SAS® Visual Text Analytics Nodes   * Concepts and Terms * SAS Visual Text Analytics information-retrieval features | Lecture: Discussion  Show and Tell  Students Working Together in productive ways  Distance Learning using the AdU-LMS | Extended Learning Activities  Productive Group Work (Individual/Group Performance Task)  **Midterm Examination** |
|  | | | | | |
| 13-14 | CILO 11: | 11 | Concept and Category Rule Definitions   * SAS Visual Text Analytics Rules * SAS Visual Text Analytics Concept Rules * SAS Visual Text Analytics Demo Category Rules | Lecture: Discussion  Show and Tell  Students Working Together in productive ways  Distance Learning using the AdU-LMS | Extended Learning Activities  Productive Group Work (Individual/Group Performance Task) |
| 15 | CILO 12: | 12 | VISUAL STATISTICS  Introduction to SAS® Visual Statistics   * Managing Reports and Pages * SAS Viya Architecture * Create a decision-tree analysis * Create reports in the SAS Visual Analytics environment   Cluster Segmentation  Models with Continuous Targets | Lecture: Discussion  Show and Tell  Summarize New Learning in A Graphical Way Provide Students with Feedback | Research Assignment  Recitation/ Class Participation  Summative  Assessment |
| 16 – 17 | CILO 13: | 13 | Final Business Analytics  Case Project Presentation and | Show and Tell  Students Working Together in productive ways  Summarize New Learning in A Graphical Way  Questioning to Check for Understanding  Provide Students with Feedback | Case Project Presentation and Documentation  Research Assignment  Productive Group Work |
| 18 | **Final Comprehensive Examination** | | | | |

1. **Other Requirements and Assessments**

Aside from the Course Outcome, the student will be graded at other times during the term by the following:

* 1. Recitation/ Class Participation
  2. Seatwork/Practice Problem Exercises/Boardwork (Individual Self Check)
  3. Case Study (Skill Warm Up, Skill Work Out, Words of Note)
  4. Productive Group Work (Individual Learnings/Group Performance Task Learnings)
  5. Research Assignment/ Extended Learning Activities

1. **Grading System**

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| **Prelim Period** | **Midterm Period** | **Final Period** | **Semestral Grade** |
| Class Standing =60%  Prelim Exam= 40% | Class Standing =60%  Midterm Exam= 40% | Class Standing =50%  Final Exam= 50% | Prelim Grade + Midterm Grade + Final Grade = **Semestral Grade** |
| **30%** | **30%** | **40%** | 65 ≥ 69 (Removal)  ≥ 70 ( Passed) |

1. **Textbooks/References**

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| --- | --- | --- | --- |
| **Title** | **Author** | **Publisher** | **Year** |
| Essentials of Business Analytics  2ed | Jeffrey D. Camm, James J.Cochran, Michael J. Fry, Jeffrey W. Ohlmann, David R. Anderson, Thomas A. Williams, Dennis | Cengage Learning | 2017 |
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**11. Classroom Policies**

The students are required and expected to be in class on time for the lecture session. If the student will be absent due to unavoidable circumstances, inform the Teacher through text or a call to the office and present excuse letter when he/she goes back to class. This is required for the lecture session. Missing classes without notification and documented reasons will lower their grade.

**Recitation/ Class Participation**

Students are hereby encouraged to actively participate and must come prepared to class in order to bring up their grades. (Please see criteria for grading the Recitation/Class Participation).

**Quizzes/ Seatwork/ Practice Problem Exercises/Boardwork (Individual Self-Check)**

The quizzes/ seatwork/ practice problem exercises/ boardwork (Individual Self-Check) should provide motivation to keep you updated and will give me a better idea of your understanding.

Long quizzes will be announced in advance for you to have time to review your handouts.

**Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises (Individual/ Productive Group Work)**

You may not always get every work 100% complete and correct but it is essential that you hand in at least your individual/group work each week, because most of your grade will be based on your performance on assigned Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises.

Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises will be presented in class on the dates indicated and will be graded on its appearance and its ability to show that the student has mastered the areas covered in the assigned work.

The students are encouraged to complete the Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises to maximize their grade.

Late Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises will be accepted only for partial credit. Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises are due at the beginning of the class on the due date. Anything turned in after that time is only for half credit.

**(Please see criteria for grading the Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises)**

**Originality**

Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project and other materials copied from other sources (articles, reports, Web pages, etc.) must be properly mentioned. Evidence that material has been taken from elsewhere without reference will be treated as plagiarism.

Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project must be entirely the student’s owns work and if it is group work it must be entirely student’s own group work. While you may discuss assignments with others, you should never copy the work of someone else.

The purpose of this is learning how to create, design and formulate the student’s own ability. Copying or collaborating defeats both these goals. The penalty for being caught is minimally a zero on the Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project for all parties involved. Maximum penalty is a failing grade for the course.

The Teacher will place a note in the students’ record of each individual associated with plagiarism or cheating and views these infractions seriously and routinely expels students who seriously violate our academic standards.

Any questions about this policy should be addressed to the Teacher in-charge.

**Major Exams**

Our major exams are divided into three, the Preliminary Examination, Mid-term Examination and the Final Comprehensive Examinations

The problems will be structured in a way that cramming does not lead to good results. Teacher will reward the ability to formulate what you have understood.

Anyone found cheating in an examination (copying from another student or using unauthorized materials, etc.) will receive a zero for the event.

Make-up exams will be given only in extraordinary and documented circumstances.

**Behavioral Policy**

Ethics – respect, trust and openness, good behavior is a must during classes. Maintain silence whenever the professor is speaking. You are allowed to speak to your teacher only if you are acknowledged. Raise your hand if you wish to be acknowledged. Failure to comply with these policies would affect your grade.

**Uniform/ID**

Wearing of ID and prescribe uniform is strictly enforced inside the campus. Therefore, you cannot attend my class if your ID is not properly displayed and if you are not in uniform.

**GENERAL RECOMMENDATION**

1. Come to class prepared and on time.
2. Actively participate in the discussion.
3. Advance the reading prior to our lecture discussion.
4. Complete and understand all Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project. Inform me if you have any question regarding the subject and post any question you may have on our LMS Class.
5. Discuss only the course materials with your classmates (but not the individual answer).
6. Learn and use productivity tools when working on the assign task – remember a computer should be a labor saving device.
7. Think before you do your Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project.
8. Plan before you do your Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project.
9. Do not wait until the night before Case Study/ Research Assignment/ Extended Learning Activities/ Practice Problem Exercises/ Course Project is due to start working on it.
10. Keep up with the lecture materials. Reviewing the material on a regular basis will save you a lot of time. Please see uploaded lecture materials in our Learning Management System (LMS) class.
11. Please feel free to ask for help as soon as you need it and do not hesitate to approach me (i.e. do not wait to ask for help if you are feeling lost).

Criteria for grading the Recitation/Class Participation:

Answer is correct and excellently delivered 100%

Answer is correct but given with some hesitation 90%

Answer is correct but given with some prodding from the teacher and/or class 85%

Answer is partially correct and given with hesitation 80%

Answer is not correct but at least the student tried 75%

No participation 0%

Criteria for grading the Research Assignment/ Extended Learning Activities:

Visual Impact (Neatness, harmony, balance, proportion, etc.) 20%

Originality/Creativity/Resourcefulness 20%

Punctuality / Promptness in submission or presentation 20%

Relevance (objective achieved) 20%

Accuracy in following the direction/ order. 20%

100%