

 <b>FLORIDA ATLANTIC UNIVERSITY</b>	<b>COURSE CHANGE REQUEST</b> <b>Undergraduate Programs</b>	UUPC Approval <u>9-9-24</u> UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner Posted _____ Catalog _____
	Department <b>ITOM</b> College <b>Business</b>	
<b>Current Course Prefix and Number</b> ISM3116	<b>Current Course Title</b> Introduction to Business Analytics and Big Data	
<i>Syllabus must be attached for ANY changes to current course details. See <u>Template</u>. Please consult and list departments that may be affected by the changes; attach documentation.</i>		
<b>Change title to:</b>  <b>Change prefix</b> From: _____ To: _____ <b>Change course number</b> From: _____ To: _____ <b>Change credits*</b> From: _____ To: _____ <b>Change grading</b> From: _____ To: _____ <b>Change WAC/Gordon Rule status**</b> Add <input type="checkbox"/> Remove <input type="checkbox"/> <b>Change General Education Requirements***</b> Add <input type="checkbox"/> Remove <input type="checkbox"/> <small>*See <u>Definition of a Credit Hour</u>.</small> <small>**WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See <u>WAC Guidelines</u>.</small> <small>***GE criteria must be indicated in syllabus and approval attached to this form. See <u>Intellectual Foundations Guidelines</u>.</small>	<b>Change description to:</b>    <b>Change prerequisites/minimum grades to:</b> No prerequisites (formerly ISM 3011)  <b>Change corequisites to:</b>   <b>Change registration controls to:</b>  Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).	
<b>Effective Term/Year for Changes:</b> Fall 2025	<b>Terminate course? Effective Term/Year for Termination:</b>	
<b>Faculty Contact/Email/Phone</b> Tamara Dinev tdinev@fau.edu		
<b>Approved by</b> Department Chair _____ College Curriculum Chair _____ College Dean <u>Marc A. Rhorer</u> <small>Digitally signed by Marc A. Rhorer Date: 2024.08.27 17:29:04 -04'00'</small> UUPC Chair <u>Korey Sarga</u> Undergraduate Studies Dean <u>Dan Meeroff</u> UFS President _____ Provost _____	<b>Date</b> <u>8/23/2024</u> <u>8/28/24</u> <u>9-9-24</u> <u>9-9-24</u> _____ _____	

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.



# ISM 3116-00X (CRN) Introduction to Business Analytics and Big Data



Instructor: TBD  
Office: TBD  
Office hours: TBD  
Email: TBD

## Course Description

This course provides an understanding of the business intelligence processes and techniques used in transforming data to knowledge and value in organizations. Students also develop skills to analyze data using generally available tools (e.g., Excel).

## Supplemental Course Description

This course introduces students to Business Intelligence, Analytics, Big Data, and their processes and techniques, such as Data Warehousing, Visual Analytics, Statistical modeling for prediction, data mining process, text web and social media analytics, optimization and simulation techniques, and big data concepts and tools. This course will include hands-on assignments using various business analytics tools such as **Excel** (Regression), **Power BI** (Dashboards), **Tableau** (Dashboards), **Azure** (Sentiment Analysis) and **Excel Solver** (Optimization). The students are assumed to be familiar at an intuitive Excel level with general business practices of collecting, storing, and using data. However, these subjects will be reviewed in detail during the course.

## Instructional Method

This class is designated as a “Lecture Capture Video Streaming (LCVS)” with an option to choose to attend class in person or watch the recorded lectures online at a time that is more convenient to them.

## Pre-requisites/Co-requisites

This course is 3-credit and serves as a core course for the College of Business. **This course has no prerequisite.** This course expects a working knowledge of basic mathematics (high school algebra), and the ability to use simple computing tools (e.g., passing familiarity with EXCEL). Students should have access to the EXCEL spreadsheet comes with Microsoft Office.

## Program Learning Outcomes Covered in this Course

Many organizations have a wealth of data residing in their databases and generate additional valuable data that is often not captured. Business intelligence (BI) is the process of collecting and turning this resource into business value. The class format consists of practical application of Excel (Regression), Power BI, Tableau, Azure, Excel Solver, discussion of several articles/cases, presentations by business professionals, class lectures and discussions on data modeling and design, and an overview of the latest AI-based data analytical applications on the market today. The Learning Outcomes for this course are the following:

- PLO(1): Students will become knowledgeable about the fundamental and ethical concepts of business intelligence and methodology.
- PLO(3): Students will learn and utilize appropriate technologies for business practices.
- PLO(4): Students will apply statistics and data analytical skills in the analysis and interpretation of business data.
- PLO(8): Students will use critical thinking to make business decisions by identifying, evaluating, researching, and proposing solutions.

### **Course Objectives/Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- **CO(1):** Explain the role of Big Data and Business Intelligence in the companies, our society, and the global marketplace. Describe the fundamental concepts of business intelligence and data analysis techniques to drive better business data-driven decision-making.
  - PLOs Covered: PLO(1)
- **CO(2):** Understand the components of business analytics – Descriptive, Predictive and Prescriptive and the technologies involved to analyze data for efficient business decisions: Power BI and Tableau (Big Data tools) for descriptive analytics, Excel (regression) and Azure (sentiment analysis) for predictive analytics and Excel Solver for prescriptive analytics (optimization).
  - PLOs Covered: PLO(3), PLO(8)
- **CO(3):** Demonstrate statistical predictive modeling using Excel Regression algorithm, creating visualizations using Power BI and Tableau on real-world datasets/website data and uncover hidden patterns/at-a-glance insights by building interactive dashboards.
  - PLOs Covered: PLO(3), PLO(4), PLO(8)
- **CO(4):** Understand the concepts of Data Warehousing and processes such as data integration, data transformation, and load (ETL).
  - PLOs Covered: PLO(3), PLO(8)
- **CO(5):** Apply communication skills by researching, developing and presenting an executive report that solves a business problem and demonstrates analytical technique used, the summary of the results regarding actionable information, and provides recommendation for data-driven decision-making.
  - PLOs Covered: PLO(1), PLO(3), PLO(4), PLO(8)

### **Course Evaluation Method**

The following components will determine your final grade:

- Mid-term Exam - 15%
- Final Exam - 15%
- Data Visualization Project - 30%
- Lab Assignments - 30%

- Discussions -10%

### Course Grading Scale

My grading philosophy is that professors do not “give” grades. Students “earn” grades. I take grading very seriously. I thoughtfully grade each assessment item on the assessment sheets. I am morally obligated to clearly define expectations (which I do on a very detailed syllabus and assignments), to help you as much as possible before your assignments are due, and to grade the actual performance using the assessment sheets. All that said, I have great empathy for college students. I care about your learning. No one would be happier than I to see all students earn high grades! In this class, the letter grades use the following scale on the total points earned from a multitude of assessments:

Grades are rounded up to the nearest tenth of a point.

94.00 and higher-----	A	74.00 through 76.99-----	C
90.00 through 93.99-----	A-	70.00 through 73.99-----	C-
87.00 through 89.99-----	B+	67.00 through 69.99-----	D+
84.00 through 86.99-----	B	64.00 through 66.99-----	D
80.00 through 83.99-----	B-	60.00 through 63.99-----	D-
77.00 through 79.99-----	C+	59.99 through 0.00-----	F

### Grade Percentage Breakdown Final Grade Assignment

Because everyone will be graded in precisely the same way, in fairness to other students, the instructor cannot and will not arbitrarily move the grading scale to accommodate individuals' specific needs or desires. All requests for an unearned extra or “bonus” point at the end of the semester to move you into the next grade category will be rejected.

### Policy on Makeup Tests, Late Work, and Incompletes

Students are responsible for arranging to make up work missed because of legitimate class absences, such as illness, family emergencies, military obligations, court-imposed legal obligations, or participation in university-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances, and debate activities. The students are responsible for giving the instructor notice before any anticipated absence and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a university-approved reason the opportunity to make up work missed without any reduction in the student’s final course grade as a direct result of such absence. Documentation will be required within 1 week of the missed exam.

### Special Course Requirements

**Lecture:** You are required to obtain the book before the classes begin.

Business Intelligence, Analytics, and Data Science: A Managerial Approach, 4<sup>th</sup> edition by Sharda, Delen, and Turban, Prentice Hall, 2017, Print ISBN: 9780134633282, eText ISBN: 978013463531

**Microsoft Power BI:** The Power BI desktop application only operates on Windows-based laptops/computers. In other words, any Apple-based computers aren’t allowed for Power BI

assignments. You may use the classroom computers to complete all Power BI assignments. Microsoft Power BI application offers an unrestricted license to use.

**Sales Force (Tableau):** The Tableau desktop application operates on any computer, including Apple-based computers. Tableau application offers 14 days of free usage, which is sufficient to complete the given assignments. A license extension is allowed if needed. Speak to the instructor about a possible extension.

### **Policy on the Recording of Lectures**

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

### **University-Approved Attendance Policy**

*Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.*

### **Counseling and Psychological Services (CAPS) Center**

*Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>*

## **Disability Policy**

*In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).*

## **Religious Observances Accommodation Policy Statement**

*In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices, observances, and beliefs with regard to admissions, registration, class attendance and the scheduling of examinations and work assignments. For further information, please see FAU Regulation 2.007 at: [FAU Regulation 2.007](#).*

## **Code of Academic Integrity**

*Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).*

## **Incomplete Grade Policy Statement**

*A student who is passing a course, but has not completed all work due to exceptional circumstances, may, with consent of the instructor, temporarily receive a grade of incomplete ("I"). The assignment of the "I" grade is at the discretion of the instructor, but is allowed only if the student is passing the course.*

*The specific time required to make up an incomplete grade is at the discretion of the instructor. However, the College of Business policy on the resolution of incomplete grades requires that all work required to satisfy an incomplete ("I") grade must be completed within a period of time not exceeding one calendar year from the assignment of the incomplete grade. After one calendar year, the incomplete grade automatically becomes a failing ("F") grade.*

## **Grade Appeal Process**

*A student may request a review of the final course grade when s/he believes that one of the following conditions apply:*

- *There was a computational or recording error in the grading.*
- *Non-academic criteria were applied in the grading process.*
- *There was a gross violation of the instructor's own grading system.*

*The procedures for a grade appeal may be found in FAU Regulation 4.002. Disruptive Behavior Policy Statement*



*Disruptive behavior is defined in the FAU Student Code of Conduct as “... activities which interfere with the educational mission within the classroom.” Students who behave in the classroom such that the educational experiences of other students and/or the instructor’s course objectives are disrupted are subject to disciplinary action. Such behavior impedes students’ ability to learn or an instructor’s ability to teach. Disruptive behavior may include but is not limited to non-approved use of electronic devices (including cellular telephones), cursing or shouting at others in such a way as to be disruptive, or other violations of an instructor’s expectations for classroom conduct.*

## **Faculty Rights and Responsibilities**

*Florida Atlantic University respects the right of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise. To ensure these rights, faculty members have the prerogative:*

- *To establish and implement academic standards.*
- *To establish and enforce reasonable behavior standards in each class.*
- *To refer disciplinary action to those students whose behavior may be judged to be disruptive under the Student Code of Conduct.*

## **Course Topical Outline**

### **TOPIC/CHAPTER**

#### **Chapter 1: An Overview of Business Intelligence, Analytics, and Data Science**

- Understand the need for computerized support of managerial decision-making.
  - Recognize the evolution of such computerized support to the current state—analytics/data science.
  - Describe the business intelligence (BI) methodology and concepts.
  - Understand the different types of analytics and see selected applications.
  - Understand the analytics ecosystem to identify various key players and career opportunities.
- CO(1)

#### **Chapter 2: Descriptive Analytics I: Nature of Data, Statistical Modeling, and Visualization**

- Understand the nature of data as it relates to business intelligence (BI) and analytics.
  - Learn the methods used to make real-world analytics-ready.
  - Describe business intelligence and its relationship to business analytics.
  - Learn about descriptive and inferential statistics.
  - Define business reporting and understand its historical evolution.
  - Understand the importance of data/information visualization.
  - Learn different types of visualization techniques.
  - Appreciate the value that visual analytics brings to business analytics.
  - Know the capabilities and limitations of dashboards.
- CO(1), CO(2), CO(3), CO(4)

### Chapter 3: Descriptive Analytics II: Business Intelligence and Data Warehousing

- Understand the basic definitions and concepts of data warehousing and data warehousing architectures.
- Describe the processes used in developing and managing data warehouses.
- Explain data warehousing operations.
- Explain the role of data warehousing in decision support.
- Explain data integration and the data, transformation, and load (ETL) processes.
- Understand the essence of business performance management (BPM).
- Learn balanced scorecard and Six Sigma as performance measurement systems.
  - CO(1), CO(2), CO(4), CO(5)

### Chapter 4: Predictive Analytics I: Data Mining Process, Methods, and Algorithms

- Define data mining as an enabling technology for business analytics.
- Understand the objectives and benefits of data mining.
- Become familiar with the wide range of applications of data mining.
- Learn the standardized data mining processes.
- Learn different methods and algorithms of data mining.
- Build awareness of the existing data mining software tools.
- Understand the privacy issues, pitfalls, and myths of data mining.
  - CO(1), CO(2), CO(4), CO(5)

### Chapter 5: Predictive Analytics II: Text, Web, and Social Media Analytics

- Describe text analytics and understand the need for text mining.
- Differentiate among text analytics, text mining, and data mining.
- Understand the different application areas for text mining.
- Know the process of carrying out a text mining project.
- Appreciate the different methods to introduce structure to text-based data.
- Describe sentiment analysis.
- Develop familiarity with popular applications of sentiment analysis.
- Learn the common methods for sentiment analysis.
- Become familiar with speech analytics as it relates to sentiment analysis.
  - CO(1), CO(2), CO(4), CO(5)

### Chapter 6: Prescriptive Analytics: Optimization and Simulation

- Understand the applications of prescriptive analytics techniques in combination with reporting and predictive analytics.
- Understand the basic concepts of analytical decision modeling.
- Understand selected decision problem models for the conception of analytics, including linear programming and simulation models for decision support.
- Describe how spreadsheets can be used for analytical modeling and solutions.
- Explain the basic concepts of optimization and when to use them.
- Describe how to structure a linear programming model.
- Understand the concepts and applications of different types of simulation.
- Understand potential applications of discrete event simulation.
  - CO(1), CO(2), CO(4), CO(5)



## Chapter 7: Big Data Concepts and Tools

- Learn what Big Data is and how it is changing the world of analytics.
- Understand the motivation for and business drivers of Big Data analytics.
- Become familiar with the wide range of enabling technologies for Big Data analytics.
- Learn about Hadoop, MapReduce, and NoSQL as they relate to Big Data analytics.
- Compare and contrast the complementary uses of data warehousing and Big Data technologies.
- Become familiar with select Big Data platforms and services.
- Understand the need for and appreciate the capabilities of stream analytics.
- Learn about the applications of stream analytics.
  - CO(1), CO(2), CO(3)

## Chapter 8: Future trends, Privacy and Managerial Considerations in Analytics

- Explore some of the emerging technologies that may impact analytics, business intelligence (BI), and decision support.
- Describe the emerging Internet of Things (IoT) phenomenon, potential applications, and the IoT ecosystem.
- Describe the current and future use of cloud computing in business analytics.
- Describe how geospatial and location-based analytics are assisting organizations.
- Describe the organizational impacts of analytics applications.
- List and describe the major ethical and legal issues of analytics implementation.
- Identify key characteristics of a successful data science professional.
  - CO(1), CO(5)

## **TOPICS INFUSED THROUGHOUT THE CHAPTERS**

### Artificial Intelligence

- New trends and developments in Generative AI. Section discussing AI as an emerging trend, the impact of AI, and the various AI tools that relate to the chapter topics.

## **Course Topical Outline**

### Data Visualization Project

#### **Purpose**

How we digest information is evolving, and for good reason — the sheer amount of data we accumulate and compile each day is staggering. In fact, according to IBM, 90% of data in the world today has been created only within the last two years. With this kind of growth, sometimes static numbers or a simple rundown of statistics can fall flat. That's why people, from data scientists to artists, use visuals to relay information.

Therefore, the purpose of this semester project is to provide hands-on experience designing and performing visualization to tell a story. I will get you up to speed with visual analytics assignments using Power BI/ Tableau during sessions 4 to 10 to serve as a guide. You may like to develop your

visual project in a way like that. I also explain what I meant by the story in a separate section below in detail to help make sense. In addition, this project offers an opportunity to learn what constitutes the best visual practices by evaluating the data visualization from others and offering creative comments for possible improvement. Your project should provide a concrete visualization of the topic/problem/issue via novel, creative storytelling. It should prove that actually *seeing* information can be practical and really cool. All worksheets in your Power BI/Tableau project need to be appropriately documented with a caption, including a relevant title with an informative question or inquiry that would be addressed by that worksheet (refer to my projects for the hint).

## **Instructions**

Projects will be carried out by an individual student.

## **Project Proposal**

As a first step you should create a project proposal (in the discussion board). The proposal should describe 1) your name and the name of the project, 2) a short (1 to 2 paragraph) description of the visualization you plan to address (i.e., story), 3) the dataset used, 4) current progress, and 5) estimated timelines. Again, check the example provided in the Data Visualization Project module in Canvas for the required format and the contents. Take advantage of this proposal as a chance to get feedback from the rest of the class on the project's direction!

## **Final Project Video Presentation**

Each student will present the final visualization, a 5-minute video, by pre-recording your presentation. The final deliverable will be a recorded online presentation telling the proposed story using a dashboard in either Power BI or Tableau, your published Power BI/Tableau dashboard in Power BI / Tableau Public, or PowerPoint. Please refer to the example provided in the Data Visualization Project module in Canvas for the format and the specific deliverables required. Your work will be evaluated using the grading rubric available under the Data Visualization Project module in Canvas. So please refer to the rubric before developing your presentation's final version.

Files to be submitted to Canvas:

- 1) Your Tableau or Power BI file in .twbx or .pbix format
- 2) URL to access your Tableau / Power BI work in Tableau Public or Power BI Public
- 3) PPT presentation
- 4 ) Pre-recorded video

## **Storytelling**

Stories bring life to data and facts. They can help you make sense and order from disparate facts. They make it easier to remember key points and can paint a vivid picture of what the future can look like. Stories also create interactivity; people put themselves into stories and can relate to the situation. As a result, they become more engaged and better understand the information.

So, what does it make a good story? Most people can easily rattle off their favorite film or book. Or they remember a funny story that a colleague recently shared. Why do people remember these stories? Because they contain specific characteristics. First, a good story has great characters. Sometimes, the reader or viewer has a vicarious experience where they become involved with the character. The character then has to be faced with a challenge that is difficult but believable. There must be hurdles that the character overcomes. And finally, the outcome or prognosis is evident by the end of the story. The situation may not be resolved, but the story has a clear endpoint.

For this project, consider your analysis of a story using a story structure. When crafting a data-rich story, the first objective is to find the story. Who are the characters? What is the drama or challenge? What hurdles have to be overcome? And at the end of your story, what do you want your audience to do as a result? Once you know the core story (*as manifested in our three labs, such as a fictional music store's online sales, your friend Harry's foodie trip, and university's fundraising, respectively*), craft your other story elements: define your characters, understand the challenge, identify the hurdles, and crystallize the outcome or decision question (*as articulated with a specific question or desired information in each worksheet of Tableau labs*).

Make sure you are clear about what you want people to do as a result. This will shape how your audience will recall your story. With the story elements in place, write out the storyboard (*i.e., the dashboard in Tableau*), which represents the structure and form of your story. Although it's tempting to skip this step, it is better first to understand your story and then focus on the presentation structure and form. Once the storyboard is in place, the other elements will fall into place. The storyboard will help you to think about the best analogies or metaphors, to set up challenges or opportunities clearly, and to see the flow and transitions needed. The storyboard also helps you focus on key visuals (graphs, charts, and graphics) you need your users to recall.

In summary, don't be afraid to use data to tell great stories. Being factual, detail-oriented, and data-driven is critical in today's metric-centric world, but it does not have to mean being boring and lengthy. In fact, by finding the real stories in your data and following the best practices, you can get people to focus on your message and, thus, on what's important. Here are those best practices:

1. Think of your analysis as a story-use a story structure.
2. Be authentic- your story will flow.
3. Be visual; think of yourself as a film editor.
4. Make it easy for your audience and you.
5. Invite and direct interaction.