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## **School of Business and Economics**

College of Professional Studies

### COURSE

**DAC 205** – PRINCIPLES OF DATA

FALL 2017

### OVERVIEW

#### 1. To keep in mind

Instructor: Dr. **Eduardo Rodriguez**

Phone: Office

E-mail: [Eduardo.Rodriguez@uwsp.edu](mailto:Eduardo.Rodriguez@uwsp.edu) I check my email regularly. This is the best way to get in touch. Please identify in the subject line of the email the course code DAB 370

Office: CPS 416

Office Hours Friday Afternoons and by appointment

Mo 12:00PM - 1:50 PM SCI B348

#### 2. Course Description

##### Scope

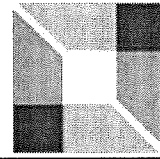
This class teaches the main approaches to understand data as a resource to develop strategic and tactic analytics based actions in current organizations. The course is designed to understand different types of data, activities to obtain data, organization of data, issues of working with data as an asset in organizations and source of the analytics process. There is an important emphasis on data governance during the presentation of the topics.

See the description of the course in the UWSP Catalog.

##### Objective

The objective of this course is to study the use of data as an asset to create knowledge and generate actions in organizations. This course exposes students to the information systems concepts related to data use and the analytics (statistics and machine learning use) requirements to develop solutions. In the course, we will review real problems that the analytics process needs to deal with in order to proceed to analysis and model development.

The course aim is to provide students with an integrated view of data not only as part of the information systems responsibilities and tasks but also how data as an asset of organizations. Data as an asset requires gathering,



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preparation, storage and control but mainly considering data as a source of value creation.

In this course, the students will be able to structure tasks that they need to perform to build usable datasets, gather data in appropriate way and to manage data in order to feed the analytics process steps. The concepts of non big data and big data will be compared the same as the use of proprietary and open data.

### Mission

SBE Mission Statement: The UWSP School of Business & Economics educates and inspires students and prepares graduates for success in positions of leadership and responsibility. We serve the students, businesses, economy and people of the greater Central Wisconsin region. Our students achieve an understanding of regional opportunities that exist within the global economy. Evidence of our graduates' level of preparation will be found in their ability to:

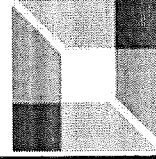
- Analyze and solve business and economics problems
- Understand the opportunities and consequences associated with globalization
- Appreciate the importance of behaving professionally and ethically  
Communicate effectively.

### 3. Learning Objectives

#### **What will you learn?**

The Data Principles course positions you in the reality of working with data. This is the first step to prepare students to the world of data based management. In today's organizations, there are several (the number is growing) organizations with Data Chief Officers and data planning and control are converted into one important role for any company. Organizations identified that in most of the cases the data actions in the analytics process are the actions that consume more time in the analytics process. If the input (data) is not correct the analytics process will be wrong and very risky. Students will learn how to organize data from gathering it to use it in the modeling process and in the creation of solutions for organizations.

In this course students review not only the concept of data as values that variables take in analytics studies, but also the course studies the principles of databases and data warehouses construction. The course identifies the way that models require specific attributes of data for use



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in different types of statistic and machines learning processes the same as in adaptive modeling and systems design.

You can join to some organizations where data evolution and work is an ongoing review process: <http://www.teradatauniversitynetwork.com/>

And <http://analytics-magazine.org/>

At the end  
of the  
course,  
you will

- Improve the capacity to identify possible issues with data and how to deal with them
- Understand, apply and develop a data assessment and develop controls to use data in the analytics process
- Develop the steps for data transformation because of formats, type of variables or new variable requirements for the analytics process
- Develop plans of action to manage data according to opportunities and limitations of the analytics based activities
- Conduct and interpret data auditing to create governance of the data sources and data to use in the analytics process
- Identify and use the different types of data in order to support the analytics process
- Evaluate different tools, methodologies, and opportunities to use several types of data
- Develop the capacity to present and communicate data assessment, plans of data organization and blue prints to develop data assets in organizations

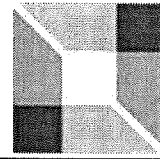
#### 4. Course Rules

Important academic  
aspects

**Attendance Policy:** You will be responsible for anything that goes on in class.

**Work turned in late:** Late work may not be accepted. If accepted, late work will lose 25% per calendar day.

**Missing Exams:** There will be no make-up exams. Students who have missed one of the midterm exams with a medical or university approved excuse, and who have notified me in advance will receive a statistically estimated score based on their other exams and project scores. For



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students who have missed more than one of the midterms or project reports, a zero will be used as the missing grade in the estimation of each missing exam. If you miss the final exam, you will receive a grade of zero for that exam.

**ADA Statement:** If you feel you may need an accommodation or special services for this class, please see me or call the service at 346-3365.

**Academic Misconduct:** Any student caught cheating or assisting another student to cheat or allowing another student to cheat may be removed from the class and given a failing grade. The minimum penalty for cheating is a reduction in points of 200% of the value of the assignment. Academic Misconduct is defined as violating provisions of Chapter UWSP 14, Rules of the Board of Regents of the University of Wisconsin System, Wisconsin Administrative Code.

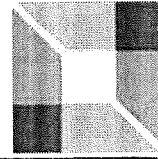
<http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>

**Technology Policy:** You may not have a laptop, tablet, cell phone or any other connected device out during class.

**Extra Credit:** Students may be given the opportunity to earn bonus points throughout the semester. I tend to put 105 points on a 100-point exam. The Project has bonus points for outstanding report and presentation. The extra points are extra credit. The availability of bonus points will be based on class pace, activities, and other circumstances. There is no guarantee that bonus points will be offered. When available, bonus point opportunities will be announced publicly in class or via D2L. No bonus point opportunities will be developed for individual students. That is, any request to earn bonus points by means of an activity that has not been publicized or offered to all enrolled students will be denied. Being absent from class automatically forfeits your right to earn the bonus points that were offered on the day you were gone. Exceptions for excused absences may be made at the instructor's discretion.

**Exam / Calculator / Cell Phone Policy:** You will need a calculator for the exams. It will need to be either a scientific or a business calculator (keys: [yx] or [^] and [ln] or [log]). You may NOT use an online calculator or a calculator on your phone, tablet, laptop, ... You may not share a calculator with another student. You may NOT have a cell phone out of your pocket/bag during an exam. Any student violating this policy will receive a score of zero (0) for the exam.

**Crib Sheet:** You are allowed a note sheet for each exam. This sheet may be up to 8.5 x 11 inches with notes on only one side. It may contain formulas, definitions, and notes on how to solve problems. It may not



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contain example problems, answers to problems or solved problems. It should have your name at the top. These crib sheets will be turned in with the exams. Any student using extra notes, or notes not allowed will receive a score of zero (0) for the exam.

### **Plagiarism**

Plagiarism is seriously taken as a form of stealing. Plagiarism happens when a writer uses the words or ideas of others as if they were his/her own words. It is often unintentional (hopefully), and can be easily avoided by always acknowledging the use of another's exact or paraphrased words/ideas with a proper citation of the source. Today's plagiarism detection software programs are extremely effective and widely used as a "stage one" screening device in the process of grading written assignments; detected plagiarism will result in an automatic "failing" grade for the course.

**SBE Events:** For this course, you must attend two official SBE Events. One event must be before the mid-semester cut-off of Fall 2017; a second event must be before the end-of-semester cut-off of Fall 2017. If you go to extra events before mid semester, those credits will carry over into the second half of the semester.

Visit the SBE Events web site (<http://business.uwsp.edu/events>) for announcements of upcoming SBE Events.

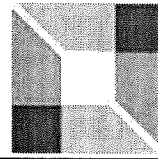
When you attend an event, it is your responsibility to sign in with your Point Card. Attendance at SBE Events will be confirmed with automatic emails to you and updated on the SBE Events web site. Please allow a week for confirmation of attendance at events held outside the SBE, such as Career Services events.

If you have multiple courses with SBE Events requirements, it is your responsibility to make sure you have attended enough events for each course. If you have not attended enough events to cover all of your courses, your attendance will be allocated to your courses in alpha-numeric order.

I will receive reports confirming your attendance. You do not need to do anything else. I will enter the SBE Event points into D2L once at the end of the semester.

### **Grading**

Grades may be curved from there at the discretion of the professor. If curved, they generally place roughly the top 25% of the students with a A



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or A- and roughly 75% of students with a A, A-, B+, B or B-. I will use whichever system gives students the higher grade.

Activity Points

Bonus SBE Events (2) 20 in total

Exam 1 100

Exam 2 100

Project 100

Final exam 100

Bonus of presentation quality in the project 30

Total 400 - 50 bonus points for project and SBE events attendance may be applied

Exam Coverage:

Exam 1: Topics covered first six weeks

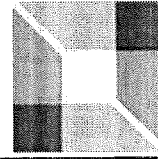
Exam 2: Topics covered weeks 8 -11

Final exam comprehensive all course chapters

Project: see description section

Grading Scale

<i>Course Grade</i>	<i>Percentage Range</i>
A	92.5% - 100.0%
A-	89.5% - 92.4%
B+	86.5% - 89.4%
B	82.5% - 86.4%
B-	79.5% - 82.4%
C+	76.5% - 79.4%
C	72.5% - 76.4%
C-	69.5% - 72.4%
D+	66.5% - 69.4%
D	59.5% - 66.4%
F	0.0% - 59.4%



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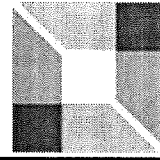
### 5. Project description

1. Select a dataset that is interesting to you (Sets of data are available for several economic sectors and problems. You can use open data. The options of data to work with will be explained in class). You can select data because of the field of application (Healthcare, Natural Resources, etc.) or because of the type of problem to solve (Search of relationships among variables, classification, etc.).
2. Your work is to present a report with the analysis of data quality, issues, and descriptions of the data.
3. You need to explain what you observe in the data, how you can deal with the issues, and propose possible solutions. Keep in mind some core ideas that you want to communicate.
4. It is very important to create the report including a summary that shows all the main points that you observed in the data and the message that you want to transfer/share.
5. Your report should be no more than five pages

### 6. Project evaluation

Total points of the project including the final presentations 100. There is an additional bonus of 30 points for an outstanding project.

<b>Attribute of project</b>	<b>Points</b>
Use of computer based tools to show the main aspects of data review	20
Organization of the ideas to communicate	20
Presentation of the report document	20
Use of the concepts presented in class	20
Presentation of possible solutions	20



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7. Structure of the document for your project

You need to include in your project document the following points:

1. **Executive summary:** you need to say what you did, how you work on the topic and what you found.
2. **Introduction:** a brief presentation of what you decided to review and the motivation for doing it. Indicate if you use some references to develop your project. You need to express in a clear way what you defined as questions to answer with your work.
3. **Methodology:** Explain what data you use, what techniques you use and why you selected them and how you interpret what you observed in your data.
4. **Results and analysis:** Present your visual representations, indicate what you observe and what you think the data is telling you.
5. **Conclusions and Summary:** Present in a graphic way the conclusions of your work. Create the dashboards or summary visual means to communicate your work.

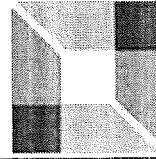
8. Course Materials

- |                 |  |
|-----------------|--|
| Required text   | • Notes of the professor and the readings indicated in the master table                                |
| Software to use | • Excel or other that the instructor can select to review in class. No programming languages required. |

9. Course Master Table

Week	Theory and problem in analytics to solve	Reading
11-Sep	The data science roadmap	Cady F. 2017 Data Science Handbook , Wiley - Chapter 2
18-Sep	Data Types	Notes from Instructor
25-Sep	Dealing with data issues	Slides from Hair et al. 2006, Multivariate data Analysis, Pearson
2-Oct	Dealing with data issues	Cady F. 2017, Data Science Handbook , Wiley - Chapter 14
9-Oct	Data Quality	Tamraparni D. and Johnson T. 2003, Exploratory Data





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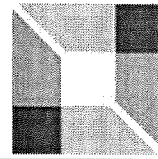
		Mining and Data Cleaning, Wiley, Chapter 4 & 5
16-Oct	Partitions of data	Tamraparni D. and Johnson T. 2003, Exploratory Data Mining and Data Cleaning, Wiley, Chapter 3
23-Oct	<b>Exam 1</b>	
30-Oct	Data bases	Rahimi S.K. & Haug F.S. Distributed Database Management Systems 2010 IEEE Computer society, Chapter 1
6-Nov	Data Warehouses/Data usable in Big data	Notes from Instructor
13-Nov	Big Data and Open Data	Notes from Instructor
20-Nov	Data and Statistical and Machine Learning Overview	Cady F. 2017 Data Science Handbook , Wiley - Chapter 4 and Instructor's notes
27-Nov	<b>Exam 2</b>	
4-Dec		Presentations
11-Dec	Course Review	Presentations

**10. Course and syllabus revisions clause**

The instructor reserves the right to include additional content or to make other revisions to the course, schedule, or syllabus as necessary. These changes may occur at any time during the semester. Students will always be made aware of these changes via an in-class announcement, D2L post, email, or some combination of these.

**11. Student responsibility to know what is required**

Student performance will involve completion of the items listed in the "Grading" section. These tasks will be communicated to students in class, on the syllabus, on the course calendar, and/or on D2L. Please note, all items that appear on the syllabus/course calendar are expected to be completed on time, whether or not the instructor announces them in class. It is the students' responsibility to know what is required and where to look on the syllabus, course calendar, or D2L in order to locate the necessary information. If there are any questions, students are encouraged to email the instructor.



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Students should check the syllabus/course calendar often so as to be aware of any changes. The "Last Updated" date is prominently displayed at the top of both of these documents. Comparing the date of your copy with that of the version available on D2L will show whether or not you are using the most recent draft. Some impromptu course points may be given without prior warning. If implemented, these impromptu points will not be stated on the syllabus/course calendar. As a rule, impromptu points, when implemented, will not constitute a significant percentage of a student's final grade (i.e.,  $\leq 10\%$  for each instance).

Unless approval is granted prior to being gone, there will be no make-ups for quizzes, in-class exercises, impromptu points, or assignments that are collected on a day that a student is absent. Students are responsible for all material covered in class and disseminated through other means, regardless of their presence in class when the information was taught. More information on absences is provided in the "Attendance" section below.

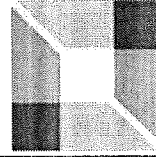
### **12. Participation**

The key to having a great semester in this class is the informed, willing, and engaged participation of all students. You will ultimately learn more and the time spent in class will be more enjoyable if everyone participates fully. Be prepared to volunteer questions and reactions regarding information from the textbook chapters, supplementary readings, and ideas brought up during class. Successful participation is achieved through consistent, daily contribution to class discussion. Merely coming to class is not the same as participating. For this course, participation is not explicitly graded; however, it will be considered when evaluating close calls in final grades.

### **13. Classroom courtesy**

**POSITIVE LEARNING ENVIRONMENT.** It is my goal to provide a safe and nurturing learning environment for all students. Therefore, breaches of classroom courtesy are defined as any behaviors that are disruptive to the learning environment. The following examples provide a foundational description of classroom courtesy:

- Displaying respect for others is required at all times. It is not required that you share the perspectives of your classmates, but rather that you do not discredit their right to have their own opinion. Expressing alternate viewpoints is important, but this should be done in a collegial manner.
- Side discussions, listening to head phones, sleeping in class, and abusive language is considered disruptive behavior.



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- No shouting, no profane language, no verbal or physical threats, no intimidation of any kind.
- Not arriving to class under the influence of any alcohol or drugs

### **14. Reviewing & disputing examinations**

Students will not be permitted to retain their past exams or review their test booklets aside from the class time allotted for this purpose. It is forbidden for students to take photographs of their exams or the exam debriefing PowerPoints. Students caught doing so will receive a zero on the exam.

Students can petition the instructor via email to review their past exam outside of class. Permission for these special appointments is at the instructor's discretion. If an outside exam review session is granted, the student is only permitted to read through his or her own exam, without taking notes or highlighting the book or any other study materials. No electronic devices are allowed during outside exam review sessions. The last day that students can review past exams, even by special appointment, is listed on the course calendar.

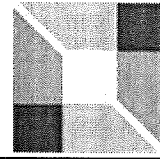
Generally, disputes involving individual exam questions are not permitted due to the bonus point opportunities built into each exam to offset possible unfairness. If there are any remaining disputes of test questions, these appeals must be hand written and submitted to the instructor by the end of class on the day the exam is reviewed.

### **15. Class video recordings/photographs**

At no time may a student (or the professor) take a photo, video, or audio recording in a regular class session without obtaining prior approval (written or verbal) from all individuals in attendance. The only exception is administrative documentation of the examination environment. That is, Exams may be video recorded or photographed by the instructor without prior consent from students. Recordings/photographs of exams will be taken for the sole purpose of resolving any possible disputes that may arise regarding exams or academic integrity. Exam recordings/photographs will never be shared publicly. Once the record maintenance period has expired, all exam recordings/photographs will be permanently erased.

### **16. Academic integrity**

Academic dishonesty includes misrepresentations of facts regarding the timely completion of exams and papers. If it is determined that students have inappropriately collaborated on exams



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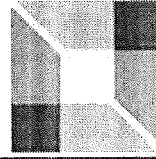
or assignment or that a student has used a classmates' responses to answer an exam question or complete an assignment, failing the course is the minimal likely appropriate sanction. Likewise, failure to properly cite sources used when completing a written assignment may lead to a failing grade on the paper or in the class. Students are expected to do their own work. If it is a group assignment equal contributions are expected. Asking another person for help if you are stuck is expected, but having someone do your work or copying another student's work is NOT permitted and is considered cheating. As a scholastic matter, it is at the discretion of the instructor to determine appropriate penalties. As a University disciplinary matter, academic dishonesty can result in suspension from the University or other lesser penalties. Any student involved in instances of academic dishonesty, intentionally or unintentionally, has failed to uphold the academic integrity of the university and is subject to penalty. Students will always be notified via email, without delay, if they incur a penalty of any kind.

The Student Rights and Responsibilities Document includes the university policies regarding academic misconduct, which can be found in Chapter 14. A direct link can be found here: <http://www.uwsp.edu/dos/Pages/Academic-Misconduct.aspx>.

UWS 14.03 defines academic misconduct as follows: Academic misconduct is an act in which a student:

- seeks to claim credit for the work or efforts of another without authorization or citation;
- uses unauthorized materials or fabricated data in any academic exercise;
- forges or falsifies academic documents or records;
- intentionally impedes or damages the academic work of others;
- engages in conduct aimed at making false representation of a student's academic performance;
- assists other students in any of these acts.

In terms of plagiarism, please note that you must reference all sources in the body of submitted papers and on a complete reference page. Source information must be provided regardless if you are quoting or paraphrasing. The rule of thumb is anything not common knowledge must be referenced. Failure to do so will result in a failing grade or a lesser grade penalty. Be aware that UWSP subscribes to Turnitin™, a plagiarism detection service, and all cases of plagiarism will be identified. Instances of plagiarism will result in course-level consequences as well as a university disciplinary case. Using the work from another student or students from past classes is not appropriate and is considered plagiarism. Information on non-academic misconduct can be found in Chapters 17 and 18 of the Student Rights and Responsibilities Document. A link to



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the university's policies on non-academic misconduct can be found at  
<http://www.uwsp.edu/dos/Pages/Information%20for%20Students.aspx>.

