

**PAD 504: DATA, MODELS, AND DECISIONS I**  
**Fall 2016 / Thursdays 5:45 pm – 9:25 pm / Husted 004 (computer classroom)**

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Office Hours: The two sections of PAD 504 cover the same material. You are welcome to attend any of the three office hours for assistance with the class material and doing assignments in Excel or Access. If you have a concern about your class performance, see your own instructor.

- Prof. Luis Luna-Reyes (instructor): Mondays 3:00-5:00 pm, Milne 206, or by appointment
- Prof. Erika Martin (instructor for other session): Wednesdays 3:00-5:00 pm, Milne 300E, or by appointment
- Ms. Sunyoung Pyo (teaching assistant for both sessions): Thursdays 9:00-11:30, Husted Café study room, or by appointment

### **COURSE DESCRIPTION**

This course introduces computer-based tools for planning, policy analysis, and decision making. Topics include evaluating the quality of data for decision making, database construction and information management, administrative and policy models in spreadsheets, making decisions with multiple criteria, an introduction to probability and decision trees, and the use of simulation models as testbeds for policy making. Emphasis is placed on summarizing information meaningfully for policy makers and different stakeholders, and using standard spreadsheet programs likely to be encountered in the workplace.

### **COURSE OBJECTIVES**

This course aims to prepare students to manage quantitative data and develop computer-based decision models to make evidence-based decisions in the public and nonprofit sectors.

Knowledge of decision analysts—Students will learn about the data production cycle, data models, issues that influence data quality and usability, the role of public policy analysis in decision-making, and the conceptual framework underlying different types of policy analysis techniques.

Skills of decision analysts—Students will be able to use Excel and Access to organize, manage, and analyze data for decision-making including: probabilistic decision trees, making decisions with multiple criteria, optimization, database construction, and sensitivity analyses.

Traits of decision analysts—Assignments and in-class activities will help students develop important traits necessary to making evidence-based decisions and informing policy debates: examining complex policy problems from multiple perspectives, presenting results from decision models to a variety of audiences, team work, creativity, curiosity, attention to detail, and becoming critical data consumers.

## **MPA CURRICULUM**

PAD 504 is a required course in the core curriculum and will prepare students to take advanced courses that build on these data skills. Excel and data skills will be used in PAD 501 (often taken concurrently with PAD 501), PAD 503, and PAD 505. This course will also prepare students to take electives in government information strategy and management, quantitative methods, and policy analysis.

The Network of Schools of Public Policy, Affairs, and Administration (NASPAA), which accredits MPA programs, expects that all MPA students will possess five universal competencies upon graduation:

1. The ability to lead and manage in public governance
2. To participate in and contribute to the policy process
3. To analyze, synthesize, think critically, solve problems, and make decisions
4. To articulate and apply a public service perspective
5. To communicate and interact productively with a diverse and changing workforce and citizenry

Although the skills in this course are most directly related to the third competency, the integrative capstone assignment also addresses the second and fifth competencies.

## **PREREQUISITES**

We assume that students have basic familiarity with Excel, including simple formulas, absolute and relative cell references, basic charts and graphs, and embedding Excel graphics into Word. These skills are covered in the MPA Welcome Week. All MPA students should have completed these workshops. Certificate and other students who were unable to attend the workshops should review the materials at <http://www.albany.edu/rockefeller/welcomeweek.shtml>. We also assume that students have basic algebra proficiency including order of operations, solving systems of equations, and probabilities. These mathematical skills were covered in the Welcome Week math refresher courses.

## REQUIRED/RECOMMENDED TEXTS AND SOFTWARE

### Required Readings, Software, and Hardware

#### *Readings:*

The Blackboard website will contain readings for each week, which will be **required**. These will be available for download from the “Readings” folder. In some weeks, students will be **required** to watch Excel or Access tutorial videos prior to class.

#### *Software:*

Students should have access to Microsoft Office 2010 or later versions, including Excel and Access. Office 365 is available for free to all students with an active University at Albany account and will be used in the classroom. The Blackboard website contains a handout on how to download Office 365 for use on your personal computer. Earlier versions of Office should work for most exercises, although there are sometimes slight differences in commands and interfaces. If you are a Mac user, you are welcome to use your personal computer for homework assignments but you should use the PCs in the computer lab during class so that you can be familiar how to do the commands on the type of computer you will use for the in-class exams. We will not provide special support for Macs, so if you are downloading Office 365 on your Mac we encourage you to make an appointment with ITS for additional assistance.

#### *Hardware:*

All students should bring a USB drive (thumb drive) to class each week. We will do extensive hands-on exercises in class, so this will allow you to save your work. Bring the same USB drive to each class, as we may work on the same dataset multiple weeks.

### Recommended Readings and Software

The following texts are **recommended** for this course, and can be purchased on Amazon or at Mary Jane’s Bookstore. Note that you can **rent** the second book (at a much lower price on Amazon. *The best handbook for Excel and Access is the one that you will use, so you are welcome to use other handbooks or online resources instead.*

1. Etheridge, D. (2010) *Excel Data Analysis: Your Visual Blueprint for Creating and Analyzing Data, Charts and Pivot Tables* (3<sup>rd</sup> ed.). Indianapolis: Wiley Publishing, Inc. [This is the same text from Welcome Week, and is also recommended in the other quantitative MPA core courses.]
2. Kroenke, D.M. & Auer, D.J. (2014) *Data Base Concepts* (7<sup>th</sup> ed.). Pearson. [See [Amazon](#) for information on how to rent the book at a substantially lower price.]

### SYLLABUS CONTRACT

I will be prepared for class, return graded assignments in a timely fashion (typically in the following week), and make myself available for office hours. You are responsible for meeting all

course requirements set forth in this document. I will notify you immediately of any syllabus modifications.

## OVERVIEW OF COURSE SCHEDULE AND ASSIGNMENTS

Date	Class Topic	Deliverables, Due at Start of Class
<u>Overview of Data, Models, and Decisions</u>		
<u>Week 1</u> Sept. 1	<b>Introduction to Data, Models, and Decisions</b> <i>Conceptual:</i> course goals, framework for how data and models can influence decision-making <i>Data skills:</i> Review <a href="#">Welcome Week workshops</a>	---
<u>Part I: Data</u>		
<u>Week 2</u> Sept. 8	<b>Data Origins</b> <i>Conceptual:</i> types of data, data production cycle, data collection methods <i>Data skills:</i> downloading data into Excel, running summary statistics to identify data anomalies	Problem set 1- Welcome Week assignment
<u>Week 3</u> Sept. 15	<b>Assessing Data Quality</b> <i>Conceptual:</i> measurement error and sources of bias, assessing data quality, how stakeholders might use data differently <i>Data skills:</i> exploratory data analysis in Excel, including visualizations and validation checks	Problem set 2
<u>Week 4</u> Sept. 22	<b>Summarizing Data</b> <i>Conceptual:</i> summarizing data meaningfully for decision-makers and different stakeholders <i>Data skills:</i> Pivot Tables in Excel	Problem set 3
<u>Week 5</u> Sept. 29	<b>Data Management I</b> <i>Conceptual:</i> core principles of data management, relational databases <i>Data skills:</i> conceptual models for database design, introduction to Access, how to create a simple relational database in Access	Problem set 4
<u>Week 6</u> Oct. 6	<b>Data Management II</b> <i>Conceptual:</i> core principles of data management, relational databases <i>Data skills:</i> basic functionalities in Access, queries, forms, and reports	Problem set 5
Oct. 12	<i>Wednesday office hours suspended for Yom Kippur (university holiday)</i>	
<u>Week 7</u> Oct. 13	<b>Midterm Exam</b> This in-class exam will cover all material from weeks 1-6.	Problem set 6

Date	Class Topic	Deliverables, Due at Start of Class
	It will be closed book, but you will take it online in the computer lab. The exam will include some problems where you will need to manipulate data in Excel or Access.	
<u>Part II: Models</u>		
<u>Week 8</u> Oct. 20	<b>Data Management III, Introduction to Decision Modeling</b> <i>Conceptual:</i> core principles of data management, relational databases, introduction to decision modeling <i>Data skills:</i> using Access for decision making, advanced forms and queries, exchanging data with Excel	---
<u>Week 9</u> Oct. 27	<b>Decision Trees</b> <i>Conceptual:</i> decision trees—intuition, interpretation of findings, and their role in decision making <i>Data skills:</i> building basic decision trees in Excel	Problem set 7
<u>Week 10</u> Nov. 3	<b>Multi-Attribute Utility Models</b> <i>Conceptual:</i> multi-attribute utility decision models—intuition, interpretation of findings, and their role in decision making <i>Data skills:</i> MAU models in Excel	Problem set 8
<u>Week 11</u> Nov. 10	<b>Optimization</b> <i>Conceptual:</i> optimization problems—intuition, interpretation of findings, and their role in decision making <i>Data skills:</i> Excel solver	Problem set 9
<u>Week 12</u> Nov. 17	<b>Simulation Modeling</b> <i>Conceptual:</i> combining data and models in simulations and scenario analysis <i>Data skills:</i> manipulate variables in simulation model <i>Other:</i> introduction to Point Claire case (capstone group assignment)	Problem set 10
Nov. 24	<i>Thursday class and Wednesday office hours suspended for Thanksgiving</i>	
<u>Part III: Decisions</u>		
<u>Week 13</u> Dec. 1	<b>Using Models to Make Policy Decisions</b> <i>Conceptual:</i> interpreting data-based models for decision-making <i>Data skills:</i> preparing model results for a policy audience, creating an audit trail of analytic decisions <i>Other:</i> free time to work on the Point Claire case in your group, with instructor available for assistance	---

Date	Class Topic	Deliverables, Due at Start of Class
<u>Week 14</u> Dec. 8	<b>Presentation Debrief and Class Wrap-Up</b> <i>Conceptual:</i> strategies for effectively using data and models for decision-making <i>Data skills:</i> presenting complex modeling results to stakeholders in an unbiased manner	Group Presentation and Group Memo
To Be Announced	<b>Final Exam</b> All material will be “fair game,” although you can expect about 2/3 of the content to be from Parts II and III. Similar to the midterm, this will be a closed-book exam in the computer lab, and expect to do manipulations in Excel and/or Access.	---

## READINGS

All of the reading assignments will be posted to the Blackboard website the week before class.

## CLASSROOM PROCEDURE

This is not a lecture-dominated class in which students listen passively. Rather, expect to be engaged in class discussion and active computer-based activities throughout class. Come to class having done the assigned readings and/or videos. We will clarify areas of confusion and build those skills in the classroom exercises, but we assume you have done the work beforehand.

## LECTURE SLIDES

PowerPoint slides and other handouts will be posted to the Blackboard website before class. You are encouraged to print and bring them to class so you can write notes.

## ASSIGNMENTS AND GRADING

### Grading

10%	Participation
25%	Problem sets (note: the lowest grade will be dropped)
25%	Midterm exam
25%	Final exam
15%	Group project

Your grade will be determined by a weighted average, using the weights described above. There is no extra credit, and I will not round up your overall score when assigning final grades. A grade of “A” reflects mastery of the material, with a strong and successful effort to think creatively about and go beyond the assigned material. A grade of “B” reflects a good,

comprehensive awareness of the assigned material. A grade of “C” reflects knowledge of much of the material, but relatively weak preparation of a substantial share of it, and/or deficient preparation of written work. A grade of less than “C” reflects major gaps in knowledge or persistent lack of performance in the various aspects of the course.

A 93-100%	A- 90-92.9%	B+ 87-89.9%	B 83-86.9%	B- 80-82.9%
C+ 77-79.9%	C 73-76.9%	C- 70-72.9%	D 60-69.9%	E <60%

### **Participation**

Participation is based on consistent, high-quality contributions to class discussions and in-class activities. You are graded on whether you are a civil and active contributor, and engaged in the hands-on exercises. You are not expected to always provide the “right” answer, but should be able to discuss and synthesize the course material and readings. Be prepared and generally enthusiastic about engaging in discussions and activities. Respond to other students’ points and challenge your classmates by offering suggestions that may be counter to the majority opinion. Offer ideas on alternative ways to solve problems. Be prepared for class by doing the readings in advance and being ready to discuss your answers to the problem sets. I value quality over content – students who provide occasional insightful comments will receive higher participation scores than vocal students whose comments have little substance.

Attendance is required. If you attend class 90% of the time, your maximum participation score (if you have excellent contributions to class discussions) is 90%. Being consistently late to class will reduce your participation score. However, if you attend all class sessions but have minimal participation, do not expect a high grade. Sitting quietly in class is worth an 80% (B-).

### **Problem sets**

There will be nine problem sets throughout the semester. Each problem set will allow you to practice the skills from the classroom on your own. Some problem sets may be in the form of a decision memo. Your lowest grade will be dropped, so only eight problem sets will be factored into the final grade.

Although you must submit your own unique work, we encourage you to work on the problem sets with other class members. If you work with other students, submit a written note with your assignment telling us who you worked with.

### **Midterm and final exams**

There will be two closed-book exams, each worth 25% of the grade. The exams will take place in the computer lab, and you will be expected to manipulate data in Excel or Access. The midterm will cover all material from weeks 1-6. The final exam is cumulative, although you can expect about 2/3 of the content to be from Parts II and III.

### **Group project**

As a capstone exercise, the class will be divided into teams which will need to use different decision models to present information to the client. The deliverables will be an in-class

presentation (due Week 13) and a memo (due Week 14). It will be an opportunity to apply the different skills we will learn about all semester, from understanding the data, to formulating different decision models, and to communicate results effectively. You will get additional information after the midterm.

## **OTHER CLASS POLICIES**

### **Attendance**

Attendance is factored into the participation grade. If you will be absent from class, you are still responsible for submitting your assignments. Email them to the teaching assistant before the start of class. An absence will not be considered “excused” without supporting written documentation.

### **Saving trees**

If you are environmentally conscious, you may print assignments on the back of used paper (such as rough drafts or printed articles). If you made a minor mistake, you may neatly correct it with pencil or pen rather than reprinting. However, do not print anything double-sided, as that makes it harder for us to grade and photocopy.

### **Late assignments**

All late assignments will be docked 10 percentage points, or one full letter grade, for every 24 hours they are late (e.g. B+ will be reduced to C+). Assignments emailed after class are late. If you are late to class, your assignment will be considered late. If you are absent, you are responsible for ensuring that your assignments are submitted prior to the start of class. Computer crashes, printer failures, rush-hour traffic, work conflicts, heavy workloads in other courses, sleep deprivation, and planned conference travel are not acceptable excuses for late assignments. Plan ahead!

### **Excused absences**

I will not grant extensions on assignments. However, I do appreciate that you may experience truly extenuating circumstances which would prevent attending class or preparing an assignment by the deadline. In these cases, speak with me as soon as possible, provide written documentation, and we will make alternate arrangements. Out of fairness to the rest of the class, I cannot adjust individual students’ deadlines without supporting documentation.

### **Tardiness**

Class starts at 5:45 pm. I understand that sometimes it is difficult to arrive on time due to work conflicts. Consistent tardiness will be reflected in your participation score. Speak with me at the beginning of the semester if you anticipate time conflicts related to professional obligations.

### **Electronics**

Please turn off all cell phones, instant messengers, and email. If you are environmentally conscious and prefer to take electronic notes and save the Blackboard readings to your laptop



or tablet, then it is okay to bring those to class as long as you are using your electronic gadgets for course-related purposes.

### **Discussing problem sets with classmates**

You are welcome to discuss problem sets with classmates outside of class. Forming a study group to share ideas is a great way to strengthen your understanding of the material, learn different ways to solve a problem, and identify points of confusion. However, you must submit solo-authored work. If you work with a classmate on your problem set, submit a written disclaimer telling us who you worked with. Suspiciously similar assignments will be considered cheating. Even if you work with a classmate, we expect that you will show us that you finished the problem sets on your own.

### **Creature comforts**

Unfortunately you cannot bring food into the computer lab. Beverages are fine as long as they are in a covered container to prevent spills. We will take at least one 10-15 minute break halfway through class.

### **Citations and academic honesty**

I take academic honesty very seriously. Cheating in any form will not be tolerated. This includes, but is not limited to, copying a homework assignment from another student, bringing outside materials into the exam without permission, and discussing the midterm exam or homework solutions with a student from the other section. You are required to be familiar with the university's academic honesty policies; ignorance is not an excuse. In all cases of cheating, a Violation of Academic Integrity Report will be submitted to the Dean of Graduate Studies to be placed in your university file, with copies provided to you, the department head, and the Dean. Additional penalties may include some combination of the following: revision and re-submission of the assignment, reduction of the grade or failure of the assignment, reduction of the course grade or failure of the course, filing of a case with the Office of Conflict Resolution and Civic Responsibility, or expulsion.

The standards are at the website below:

*[http://www.albany.edu/graduatebulletin/requirements\\_degree.htm#standards\\_integrity](http://www.albany.edu/graduatebulletin/requirements_degree.htm#standards_integrity)*

Avoid plagiarism by properly acknowledging material and ideas taken from other sources. The University of Albany Library offers a useful tutorial on plagiarism and how to avoid it.

*<http://library.albany.edu/usered/plagiarism/index.html>*

If you cite a source (such as a class reading, lecture note, or outside sources), you must document it. Restate ideas in your own words or else use quotation marks around the relevant passages. In all instances, insert a footnote or endnote with the reference. I have no preference for how you format your references (e.g. APA style versus Chicago style), but select one standard style and be consistent. If you cite something from the PowerPoint slides, include the

date and slide number. If you cite something from class discussion, include the date. See me in office hours for a tutorial on how to add references in Word.

As noted above, if you work with a student on your weekly problem set, submit a disclaimer with your assignment saying who you worked with. Although I encourage you to discuss the assignment with your classmates, your submission should reflect your own work.

### **Grading and appeals for grade change**

If you are dissatisfied with your grade or think I made an error, you may make a written appeal describing why you think your grade should be changed. This appeal should be typed and be delivered to me (in person or by email) within 48 hours of receiving your assignment. Your grade may be lowered, increased, or remain the same. I will not consider a grade appeal that is delivered orally or after this deadline; you must submit your typed appeal within 48 hours.

### **Disability statement**

Please see me if you have a disability documented by the Office of Disabled Student Services (in the Department of Student Life) to request accommodations.

### **Incompletes**

I will not grant an incomplete except in the case of truly extenuating circumstances with written documentation. Be forewarned that if we mutually agree on an incomplete grade, I will likely still require you to attend class. If you need to request an incomplete, speak with me as soon as possible.

### **Course feedback**

I genuinely want to make this the best educational experience it can be for you and future students. I am receptive to and grateful for all suggestions about the course. If you are not comfortable providing me or the teaching assistant feedback in person, then you can put anonymous suggestions in my faculty mailbox on the first floor of Milne. At the start of the semester we will appoint a student ombudsman who you can contact confidentially with any course concerns.