



Dillard College of Business Administration

Syllabus: Model-Based Problem Solving
BUAD 5623-X10
Spring 2023

Contact Information:

Instructor: Dr. Pablo A. Garcia-Fuentes
Office: Dillard Building 292
Office Hours: Monday and Wednesday 8:30 am to 10:00 am, and Tuesday 8:30 am to 10:30 am.
Also, by appointment (You are welcome to stop by at any time).
We can also meet on Zoom at [ZoomMeeting](#)
Phone: 940-397-4717
Email: pablo.fuentes@mwsu.edu

Instructor self-introduction

Dr. Garcia-Fuentes is a native of Nicaragua, Central America. He received his Ph.D. in agricultural economics from Louisiana State University in 2009, his M.S. in agricultural economics from North Carolina Agricultural and Technical State University in 1997, and his B.S. in agronomy from the Universidad Nacional Agraria, Nicaragua in 1992. He taught economic courses from 2010-2012 at Southeastern State University in Hammond, LA. He taught a graduate course in international agricultural trade in the spring of 2013 at LSU. He has been teaching economic courses at Midwestern State University since the fall 2014. He represents the college of business on the EURECA committee and is the sponsor of the Financial Management Association. He has mentored several EURECA research projects and has been organizing the DCOBA forecast competition. He has been conducting research on issues of economic growth and development, exchange rate, price analysis, remittances, and foreign direct investment. He is pleased to be your instructor, and he thanks you for taking this class.

Welcome:

Welcome to BUAD 5623. It is a graduate course. MBA students are no longer undergraduate students. MBA students are treated as managers who are critical thinkers and problem solvers.

Text:

Hillier, F. S., and G. J. Lieberman. 2021. *Introduction to Operations Research*. 11th ed. New York: McGraw-Hill Education. (Required)

Emrouznejad, A., and W. Ho. 2011. *Applied Operational Research with SAS*. Boca Raton, Florida: Taylor and Francis Group, LLC. (Required)

Supplemental Texts:

SAS Institute Inc. 2018. *SAS/OR 15.1 User's Guide: Mathematical Programming*. Cary, NC: SAS Institute Inc. It can be downloaded at [15.1User'sguide](#).

SAS Institute Inc. 2018. *SAS/OR 15.1 User's Guide: Mathematical Programming Examples*. Cary, NC: SAS Institute Inc. It can be downloaded at [15.1User'sguide](#).

SAS Institute Inc. 2015. *Step-by-Step Programming with Base SAS® 9.4, Second Edition*. Cary, NC: SAS Institute Inc. It can be downloaded at [Stepbystepprogramming](#).

SAS Institute Inc. 2015. *SAS/OR® 14.1 User's Guide: Mathematical Programming Legacy Procedures*. Cary, NC: SAS Institute Inc. It can be downloaded at [14.1User'sguide](#).

SAS Institute Inc. 2018. *SAS/OR® 15.1 User's Guide: Project Management*. Cary, NC: SAS Institute Inc. It can be downloaded at [15.1User'sguide](#).

The supplemental texts are great references for learning about SAS coding. They help students understand the SAS coding we will use in this course.

Software:

This course requires students to use SAS. Students can use SAS OnDemand or SAS in the computer labs in DCOBA. SAS on Demand is free. Please watch the video “SASvideo” posted on D2L to learn how to run a SAS program on SAS Studio. See the instructions on how to create a SAS profile and a SAS library on the last page of the syllabus.

Learning SAS OR:

The course introduces students to using SAS OR. The supplemental texts explain the SAS code used in this course. One way to learn SAS OR programming is to run the chapters' programs, use the supplemental texts as reference, ask questions to the instructor, and invest enough time on it. The ideal scenario would be to take a SAS programming class first and then take this class, but there is no time for this. Therefore, students must invest enough time into learning SAS programming.

Computer operating system:

The instructor uses the Microsoft computer operating system. Students are responsible for submitting assignment documents/files that can be managed with the Microsoft operating system. The instructor will not be able to help students who own Mac computers due to different computer operating systems. I recommend you use a Microsoft operating system computer.

Copyright:

The class materials associated with this course are provided to facilitate student learning and are protected by the United States copyright laws. Dissemination or sale of the class material (including the World Wide Web) is not permitted. The class material is only available to students enrolled in the course that requires the use of the corresponding textbook. Students should abide by these restrictions. The publishers of the textbooks own the copyright for the class materials associated with this course.

Course Description:

This course gives students an introduction to linear programming and mathematical programming. It covers the following topics: linear programming and the simplex method, the theory of the simplex method, duality theory, linear programming under uncertainty, other algorithms of linear programming, the transportation and assignment problems, network optimization models, dynamic programming, integer programming, nonlinear programming, and decision analysis.

Suggestions to students:

BUAD 5623 is a graduate course, which is a higher-level course and very different from undergraduate courses. To be successful in this class, students must spare at least two days a week to read the class materials, run and understand the chapter SAS-program, and do the homework. This is one of the toughest classes in your program. However, the instructor will be pleased to help you with any questions you may have. Do not hesitate to contact the instructor if you need help, Dr. Garcia-Fuentes's goal is to help students be successful.

Course Prerequisites:

Consent of the graduate coordinator.

Learning Goals:

The general objective of this course is to help students learn about linear programming and mathematical programming and their applications to allocation of scarce resources to productive activities.

A. General Learning Goals:

1. Leadership. By engaging students in the analysis of linear programming and mathematical programming, this course aims to contribute to developing students' ability to make more effective business decisions.
2. Critical Thinking. The students will demonstrate their critical thinking abilities developing and solving linear programming models that are related to business decisions.
3. Communication skills. By engaging students in the solving of linear programming problems, this course aims to contribute to developing students' ability to communicate their analyses in a professional manner.
4. Integrate knowledge across business disciplines. By engaging students in the solving of linear programming problems, this course aims to contribute to developing students' ability to integrate operations research methods with other business disciplines.
5. Personal Responsibilities. Students will demonstrate their abilities in connecting choices, actions, and consequences that are related to economic reasoning and ethical decision-making when solving linear programming problems.

These general learning goals either represent or are related to those established by the Dillard College of Business Administration. The learning goals represent the skills that graduates will carry with them into their careers. While assessing student performance in obtaining these general learning goals, the College seeks to assess its programs. The assessments will assist us to improve our curriculum and curriculum delivery.

B. Course Specific Learning Goals:

- Learn about linear programming and the simplex method.
- Learn about the theory of the simplex method.
- Learn about duality theory.
- Learn about linear programming under uncertainty.
- Learn about other algorithms of linear programming.
- Learn about the transportation and the assignment problems.
- Learn about network optimization models.
- Learn about dynamic programming.
- Learn about integer programming.
- Learn about nonlinear programming.
- Learn about decision analysis.

Teaching Method:

Given that this is an online course, the course starts on 08/22/2023 and ends on 12/14/2023, as suggested by the 2023-2024 academic calendar. The student must read a chapter a week as shown in the course outline below, run and understand the chapter SAS-program, and submit an assignment a week on D2L. The student is responsible for reading each assigned chapter and any additional class material. Class materials will be posted on D2L. The student can ask questions on any point that is not understood. The instructor has academic freedom to bring in class material and technology in

his own way. In this class, you will use the internet to access the class materials posted on D2L. The week starts on Monday and ends on Sunday.

Course Policies:

A. Attendance Policy:

Attendance will be checked each week based on assignment submissions and on student access to the course on D2L. Students are expected to submit all assignments (attend all scheduled classes) for this course given the university attendance policy. Missing 2-chapter assignments from 08/28/2023 to 10/30/2023 is considered excessive by the instructor; therefore, students who reach this level of missed classes will be dropped by the instructor with a grade of “F”, given the university attendance policy. Additionally, missing 3-chapter assignments during the semester is also excessive; therefore, students who reach this level of missed assignments will get a final grade of “F”, given the university attendance policy, as shown in the Student Handbook and Activities Calendar which may be found at [Handbook](#).

B. Other Related Policies

Graduate Course:

BUAD 5623 is a graduate course and students are treated as graduate students and managers. This is different from being an undergraduate student. Therefore, students must comply with the course policies.

Academic Integrity:

Regarding academic honesty, students are referred to the “Student Honor Creed” and “Academic Dishonesty Policies and Procedures” in the Student Handbook, which may be found at [Handbook](#).

Declaration of AI use:

Students must declare their use of artificial intelligence (AI) when they use AI in any work that is required in this course. Failure to declare the use of AI will be considered academic dishonesty as defined in the Student Handbook. Using AI responsibly means that you must have control over it to avoid bias (I do not use AI at all in my scholarly work).

Please add the statement below at the end of your homework/assignment to declare the use of AI.

Statement: I “your name here” declare that have used the following AI tools/services “Tool names/services here” in this homework, assignment, exam or the like”. I also state that I reviewed and edited the content as needed and take full responsibility for it.

If the instructor finds out that a student used AI and failed to declare its use, the student will receive zero credits on the assignment.

This policy does not apply to the use of basic tools to check spelling and grammar.

Exam Policies:

Exam policies are related to academic integrity and can also be stated on the first page of the test.

Americans with Disability Act:

This class follows the guidelines suggested by the Center for Counseling and Disabilities Services for those students who qualify for disability services. Please notify the instructor of your special needs during the first week of classes (See the section on “Disability Support Services” in the Student Handbook).

Syllabus Change Policy:

- This syllabus is a guide for the course and is subject to change.

Correspondence:

All correspondence regarding class issues must be conducted in person or by email using your Midwestern State University (MSU) email only. I will not return answers to questions to other email accounts. Grades will be posted on D2L and on MSU Banner. I will not discuss grades or class standing over the phone or by emails. Since email is often the most convenient means of communication, it is recommended that students use and regularly monitor their MSU email account. Grades will not be transmitted electronically (e.g., emails).

I suggest that you link your D2L email with your MSU email, so the messages sent through D2L will be forwarded to your MSU email. To do this,

- Log in to D2L.
- Click on your name on the right upper corner of the screen.
- Click on “account settings”.
- Click on “email”.
- Check “Forwarding incoming messages to an alternate email account” and enter your email in the box.
- Click on “save and close”.

Netiquette: Communication Courtesy Code:

Students are expected to follow rules of common courtesy in all email messages, class discussions, lecture hall posts, chats, etc. If I consider any of them to be inappropriate or offensive, I will forward the message to the Chair of the department and the online administrators and appropriate actions will be taken.

Deadlines:

We cannot totally rely on cyberspace—emails get lost, and servers disconnect temporarily. Do not wait for the last hour to do your homework. Reply and check for replies on every email sent and received. The student is responsible for checking deadlines on D2L and for submitting the work to the instructor on time. *I will not reply to emails regarding homework issues during the last 7 hours prior to the deadline.*

Proctoring of exams

Because this class can use online proctoring such as ProctorU or a similar software, students will be required to pay the proctoring fees when taking the exams. In addition, because this is an online course, students are required to have a webcam.

Webcams

This course requires students to have access to a web cam.

Exams, Coursework and Grades

Exams: During the semester, there will be a midterm exam and a comprehensive final exam (200 points each). The exams can be take-home exams. The two-exam scores will be for 400 points or 66.7% of your course grade. The exam's instructions and policies will be stated on the first page of the exam. The instructor has academic freedom to include any type of questions in the exams.

If a student misses an exam without prior approval from the instructor, please do not expect a make-up exam. With the instructor's prior approval, you may take a make-up exam during the week of finals. If you anticipate a valid reason for missing an exam, please inform the instructor in advance by email. An unexcused absence from an exam will result in a score of zero on that exam and may be compensated for by counting your final exam in its place with the instructor's approval, and a 20% penalty on that exam's score will be assessed. The exam dates are noted in the Tentative Course Schedule in this syllabus. Any changes to those dates will be announced as soon as possible and posted prominently on D2L.

Assignments: There will be 12 assignments corresponding to the chapters that will be covered during the semester. The assignments will be submitted through D2L. The instructor has academic freedom to include any type of questions in the assignments. There will be no make-up assignments under any circumstances. The student is responsible for having an appropriate internet connection. If you do not have an appropriate internet connection and fail to submit an assignment, do not expect a make-up assignment. You are expected to complete each assignment by the deadline. You will have an adequate amount of time for each assignment, and you must not fall behind. If you miss an assignment, you will earn zero credits. Your score for all assignments will be 200 points or 33.3% of your course grade.

Grades will not be transmitted electronically (e.g., emails). Grades will be posted on D2L and on MSU Banner. I will not discuss grades or class standing over the phone or by emails. You are welcome to come by my office to discuss your grade.

Course Grade:

Course work	NA	Grade Scale	Percentages*	NA
Assignments (12)	200 pts	540-600 pts	90% & above	A
Exam 1	200 pts	480-539 pts	80%-89%	B
Exam 2	200 pts	420-479 pts	70%-79%	C
Total	600 pts	360-419 pts	60%-69%	D
NA	NA	below 360 pts	below 60%	F

* Percentages are only given for relative levels. Your final score is a total of all your exam, quiz, and homework scores with any bonus points added separately. Therefore 89% is not 1 point short of an A. 89% is only 534 points, which is 6 points short of an A.

Senate Bill 11

Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at [campus handgun policy](#).

Outline of the course

BUAD 5623- X20

Spring 2023

(Subject to changes and additional readings)

Week and dates	Chapter	Topic
Week 1 (Aug 28)	NA	Syllabus, SAS on demand, and SAS programming introduction
Week 2 (Sep 4)	3	Introduction to linear programming
Week 3 (Sep 11)	4	The simplex method
Week 4 (Sep 18)	5	The theory of the simplex method
Week 5 (Sep 25)	6	Duality theory
Week 6 (Oct 2)	7	Linear programming under uncertainty
Week 7 (Oct 9)	8	Other algorithms for linear programming
Week 8 (Oct 16)	Exam 1	Exam 1: Chapters 3 to 8; due 10/23/2023.
Week 9 (Oct 23)	9	Transportation and assignment problems
Week 10 (Oct 30)	10	Network optimization models
Oct 30, 2023	NA	Last day for "W" at 4:00pm. Drops after this deadline receive an "F"
Week 11 (Nov 6)	11	Dynamic programming
Week 12 (Nov 13)	12	Integer programming
Week 13 (Nov 20)	13	Nonlinear programming; Thanksgiving Holiday (11/23)
Week 14 (Nov 27)	16	Decision analysis
Week 15 (Dec 4)	Final exam	Chapters: 9, 10, 11, 12, 13, and 16; due 12/11/2023

Note: The instructor can change the exam dates and locations if it is necessary.

SAS On Demand instructions

1. Create a SAS profile at [SASonDemand](#).
2. Log in to SAS On Demand
3. Click on SAS Studio.
4. Click on Server Files and Folders
5. Expand odaws03-usw2
6. Expand Files (Home)
7. Right click on sasuser.v94, then new, then folder, name your folder BUAD5623, then save.
8. To upload files: right click on the BUAD5623 folder, then upload files, then choose files, then choose your file, then open, then upload.
9. Press F4. A new SAS program opens.
10. Paste chapter 3 SAS program posted on D2L to your Code window and run the SAS program.
11. The statement `libname BUAD5623 '/home/u45422697/sasuser.v94/BUAD5623';` creates a new SAS library.

Your SAS user number “u#####” is different from mine “u45422697”, it is shown in the bottom right corner of the SAS screen. So, you need to change it to yours.

12. Click on Libraries and you will see your library.

13. Another way of creating a new library:

- 13.1. Click on libraries
- 13.2. Click on the new library icon that is below “Libraries”
- 13.3. Name your library BUAD5623
- 13.4. Click on browse
- 13.5. Expand Files (Home)
- 13.6. Expand sasuser.v94
- 13.7. Click on BUAD5623
- 13.8. Okay, then okay
- 13.9. Expand my libraries, your BUAD5623library is created.