



Terry College of Business  
Department of Insurance, Legal Studies, &  
Real Estate

UNIVERSITY OF GEORGIA  
Department of Insurance, Legal Studies, & Real Estate

Terry College of Business  
BUSN 4000  
Fall 2022

# **BUSN 4000: Predictive Modeling and Optimization Fall Semester, 2022**

## **Syllabus**

**Instructor:** Dr. Paul Holmes  
**Office Location:** B220E Amos Hall  
**Email:** pholmes@uga.edu  
**Office Hours:** see eLC homepage  
**Course Website:** <https://uga.view.usg.edu/>

Class Meeting Information			
Section Number	Meeting Time	Building	Room No.
49860	TR 8:00AM-9:15AM	Park Hall	Rm. 265
13084	TR 9:35AM-10:50AM	Park Hall	Rm. 265

**Please note this is an in-person, synchronous course.**

### **Course Description**

Focuses on calculus, statistical inference, predictive modeling, and optimization. Special attention will be given to the foundations of these topics and also to the modeling and application of these tools within all the functional areas of business.

**Prerequisite: MSIT/BUSN 3000.**

### **Learning Outcomes**

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

- 1) Recognize the principles that underlie causal inference.
- 2) Employ statistical methods to predict organizational and market outcomes.
- 3) Apply the concept of the derivative to determine optimal outcomes.

## Course Materials

**Textbook (Required):** *Applied Calculus & Regression Analysis: University of Georgia Custom Edition* by Tan/Dielman. (South-Western Cengage Learning, ISBN 9781337037853). Access to the e-book version of the text is provided through WebAssign (details below), which is the option selected by most students (ie. you do not need to purchase the physical textbook). Whereas the physical book is currently out of print, you can still purchase used copies online (at a low price).

**Enhanced Webassign (Required):** Homework for the course will be completed via WebAssign which will require purchasing an access code. You should access WebAssign using the link provided on eLC, in order to sync your WebAssign account to the eLC gradebook. WebAssign accounts are course/textbook specific, so you will still need to purchase an access code, even if you've used WebAssign before in another course.

**Course Website (eLC):** eLC is an integral part of this class. The instructor will make announcements on eLC and students are expected to download handouts and other material from the site. Not having access to eLC is NOT an excuse for falling behind in the course. To access this class's eLC account, go to <https://uga.view.usg.edu/>. Enter your UGA MyID and password. Select "BUSN 4000".

**Calculator (Required):** A non-programmable, non-graphing, non-cellphone calculator with squaring, square root, and exponent capabilities is required. The calculator must not perform symbolic operations in calculus, and should not be able to communicate externally (infrared, wi-fi, Bluetooth, etc). The use of any calculator in violation of this policy on tests is prohibited and considered a violation of the academic honesty policy. **The use of an unauthorized calculator on any test will result in the forfeiture of all points on that test.** Note that a basic scientific calculator, such as a Casio FX-260 or Texas Instruments TI-30Xa, will be fine.

**Computer:** You will need access to a computer equipped with Microsoft Excel in order to complete the homework for the course. You will also need installation permission on the computer, in order to install the BUSNReg add-in necessary to complete some of the later homework.

## Attendance

**Regular class attendance is strongly encouraged.** A student who misses a class is responsible for all material missed. To help promote the learning process and enable students to gauge their understanding of the current material, a certain portion of most classes will be devoted to interactive problem solving. The instructor will display questions overhead, and students will be encouraged to work the problem in class. These problems will not be for credit but students are expected to work the problems in class in order to gauge their understanding of the material. Since attendance is not for credit, students do not need to notify their instructor on occasions when they need to miss class.

The Terry College is committed to promoting diversity, equity, inclusion, and belonging among its students, faculty, and staff. This class welcomes the open exchange of ideas and values freedom of thought and expression. This class provides a professional environment that recognizes the inherent worth of every person. It aims to foster dignity, understanding, and mutual respect among all individuals in the class.

## Grading Policy

Each student's final course grade will be determined based on their performance using the following grading criteria. The baseline grading scale will be as follows:

### Course Grade Assignment

Letter Grade	Percentile Grade	Letter Grade	Percentile Grade
A	93-100%	C+	77-79.9%
A-	90-92.9%	C	73-76.9%
B+	87-89.9%	C-	70-72.9%
B	83-86.9%	D	60-69.9%
B-	80-82.9%	F	Below 60%

### Course Grade Breakdown

Class Component	Grade Scheme I	Grade Scheme II
Homeworks (WebAssign)	25%	25%
Highest Midterm Exam Score	20%	20%
Lowest Midterm Exam Score	20%	15%
Final Exam (Cumulative)	35%	40%
<b>Extra Credit:</b>		
About The Course Homework (due Fri 8/26)	2%	2%

Your final course grade will be determined based on the grade scheme through which you score highest. Additionally, any student scoring 80%-or-higher on **all eleven** regular homework assignments will be awarded an extra point on their overall course grade. It is strongly recommended that you complete each homework **at least 48 hours** prior to the due date where possible, since technical (or medical) problems (or lapses of memory) can – and often do – happen.

## Exams

Please make note of the midterm dates and times listed below:

- Midterm I: Thursday October 6<sup>th</sup> & Friday October 7<sup>th</sup>
- Midterm II: Thursday November 17<sup>th</sup> & Friday November 18<sup>th</sup>
- Final Exam: Friday December 9<sup>th</sup> at 7pm

The midterms are WebAssign based and will be scheduled in a computer lab outside of normal class meetings, on either a Thursday or a Friday. A sign-up sheet will be posted on eLC for you to select a time that fits your schedule on one of these two days. No make-up test will be offered outside of this two-day testing period. If you know you have certain schedule conflicts over the testing window, you should complete the sign-up survey as soon as it is available (typically on the Thursday morning, 14 days prior to the test) since all slots are available on a first-come, first-served basis, with no exceptions. If you fail to select a time during this sign-up period, which will run through 11:59pm on the Sunday prior to each test, you will be assigned a time by your instructor out of the time periods still available.

When completing a booking via the sign-up survey please ensure all details are entered correctly, since it is important the information submitted match that in the course gradebook. Once you reserve a test slot

you will immediately be sent a confirmation email with the details of your reservation. This email is your confirmation that you completed the booking form and the reservation went through, although if the details contained are incorrect, or if the time selected no longer suits your schedule, you should immediately cancel the reservation and make a fresh booking using the reschedule link at the bottom of the confirmation email. Note that making a second reservation (or more) without cancelling earlier bookings may see you forfeit all submitted reservations.

**If you do not receive a confirmation email, you will need to return to the reservation site and complete the booking in its entirety using your UGA email address, since without this confirmation you do not have a booking.** Shortly after the sign-up window closes, confirmation of your exam time and location will be posted to the grade section of eLC. If you wish to notify your instructor about a discrepancy between the posted time and the one listed on eLC, you must forward your instructor the confirmation of booking email when doing so. **Again, if you do not have a confirmation email, or if the details listed on the email do not match that in the course gradebook exactly, you did not have a booking.**

**Note that anyone taking the test at a time or location other than the one officially listed in the eLC gradebook on the Tuesday prior to the test will receive a 10-point deduction to their test grade. Additionally, failure to follow test instructions and procedures (including, but not limited to, providing photo ID, signing out of the room at the end of the test, or arriving at the test location after other students have started testing) may receive additional penalties.**

Any technical difficulties (such as computer/Microsoft Excel problems) must be reported to the exam proctor immediately at the time of the test by the student. Any accommodations for those difficulties will be provided during that testing session. No additional accommodations will be provided once the student has left the exam room.

Any answers not submitted *prior* to time expiring on the test will not be credited, and there will be no automatic submission of typed responses at the moment time does expire. As a result, you should submit any typed responses frequently throughout the test, particularly in the last 5-10 minutes. Whereas a WebAssign clock timer will typically display the time remaining during the test, it is a student's personal responsibility to monitor their own test time should this timer fail to appear or function correctly. Each test slot will finish at the scheduled time, meaning that if you arrive late you will not receive the full time permitted.

After each midterm you may examine your test - both to see what you missed and to identify any grade issues - during a series of lab office hours that will be posted on eLC. **The final date to examine your test will be Thursday December 1st, after which time the posted midterm grades become final.**

The final will be cumulative, multiple choice and administered via scantron (not computer) with all necessary output provided as part of the test booklet.

Be aware that exams may cover material from class, as well as from the textbook, homework and course videos. All exams begin promptly. Please be considerate of your classmates by arriving on time. If you arrive after at least one student has finished the exam and left the room, you will NOT be allowed to sit for the exam, and will receive a "0". Turn off cell phones before entering the exam room. If your cell phone rings or vibrates during the exam, you may receive a "0" on the exam.

For each exam you will need to bring your student ID, a pencil and a calculator that meets the previously stated calculator policy. **Note that cell phone calculators are not allowed!** ANY USE OF GRAPHING/PROGRAMMABLE CALCULATORS, CELLPHONES, iPADS, OR ANY DEVICE WITH INTERNET ACCESS DURING A TEST WILL BE REPORTED TO The Office of Student Academic Services. Note you will also need your login details for both your UGA and Cengage accounts to be able to access the computerized test.

**No make-up exams will be offered, under any circumstances.** If you cannot take a midterm test due to an extreme and well-documented emergency (e.g. death in the family, appendicitis, athletic conflict), your professor may add the weight from the missed test to your final exam after receiving sufficient documentation. If you do miss a midterm test for a documented emergency, the remaining midterm test will be worth the full 20% of your grade and cannot be exempted even in the case of an additional emergency. If a student cannot take the final exam at the scheduled time due to an extreme and well-documented emergency, the student may be permitted (at instructor's discretion) to take the test during the next offering of the course final exam, which may be in a future semester.

If you would like to appeal your grade in the course, this appeal must be made in writing within one week of the posting of the grade.

## **Classroom Policies & Procedures**

1. The instructor holds the following expectations for all students.
  - Show respect for the instructor, teaching assistants, and other class members at all times.
  - Uphold [A Culture of Honesty](#) at all times during the semester, both within and without official class meetings.
  - Arrive to class on time and prepared. This includes both academic preparation (e.g., having completed required readings, homework assignments, etc. and otherwise contributing to class activities when appropriate) and organizational preparation (i.e., bringing required materials to class like the notes, calculator, etc.).
  - Print out notes from eLC and bring them to class, so that you have access to all output when answering class questions, and to help you keep good notes in the course.
  - Participate in class activities in such a way as to maximize learning opportunities for yourself and others.
2. Ringing cell phones will NOT be tolerated in class. Each student is responsible for putting their cell phone on silent before entering the classroom.
3. Leaving class before the class period has finished without prior approval from the instructor will not be tolerated.
4. In general, you are responsible for devoting the time and effort necessary to master the material covered in this course. A rule of thumb is that two hours spent outside of class are needed for every hour spent in class. Depending on your background and aptitude, you may need more study time. Be aware that exams may cover material from class, as well as from the textbook and homework.
5. You are responsible for all announcements and assignments made in class and/or on eLC. This includes exam dates or homework deadline changes, etc. In general, the instructor will not respond to emails containing questions about information that may be found in the syllabus or on eLC.
6. The best way to contact the instructor is via email at [pholmes@uga.edu](mailto:pholmes@uga.edu). Do not email through the messaging tools in WebAssign or eLC.

## Honor Code

"I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at <http://www.uga.edu/ovpi>. All academic work must meet the standards contained in "A Culture of Honesty". Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

## Homework

Student engagement with the course material outside of class is considered an integral part of the learning process. There are eleven required homework assignments planned for this semester, with the lowest homework grade being dropped. Since one homework grade will be dropped, **NO MAKE-UP assignments and NO LATE assignments will be accepted REGARDLESS OF ANY REASON. Furthermore, last minute computer failures, illnesses, etc. will not excuse you from meeting the homework submission deadlines.**

Individual assignment information and due dates can be found in the table below. **All assignments are due by 11:59PM on the dates shown.**

### Homework Schedule

Assignment	Due Date	Due Day	Textbook Reference
HW0*	8/26	F	
HW1	8/31	W	Tan Ch. 1
HW2	9/7	W	Tan Ch. 2 Pt. 1
HW3	9/14	W	Tan Ch. 2 Pt. 2
HW4	9/21	W	Tan Ch. 3 Pt. 1
HW5	9/28	W	Tan Ch. 3 Pt. 2 & Ch. 4
HW6	10/5	W	Tan Ch. 5, 8, Dielman Ch. 2 & Add. Notes 1
HW7	10/21	F	Dielman Ch. 3 & 4 Pt. 1
HW8	11/2	W	Dielman Ch. 3 & 4 Pt. 2
HW9	11/9	W	Dielman Ch. 5 & 6
HW10	11/16	W	Dielman Ch. 7
HW11	12/6	T	Dielman Ch. 8 & 10

**\* HW0 is an "About The Course" Homework, worth two points extra credit, covering course policies and procedures.**

## Getting Extra Help

As the material in this course builds on itself over the semester, it is important that you not fall behind. You may wish to try the UGA Tutorial Program located in Milledge Hall. Tutors are free of charge and require only that you reserve their time in advance. For information call 706-542-7575. Additionally, a list of former BUSN 4000 students interested in privately tutoring for the course (for pay) can be found on eLC.

## **Incomplete Policy**

A grade of Incomplete (“I”) will only be given only if a student has a grade of “B” or higher but, for non-academic reasons beyond his/her control, was unable to meet the full requirements of the course. If an “I” is issued, all course requirements must be completed by the end of the following semester. If the student does not do so, the “I” will automatically changes to a grade of “F.” Students who wish to invoke this policy must provide their instructor with documentation of the non-academic circumstances that impeded course completion.

## **DRC Accommodations**

If you have a legally-identified disability and believe you are entitled to accommodations, contact me no later than one week after a) you add the course, or b) your disability status legally changes. The provision of any test accommodations requires at least a full weeks’ notice. If you wish to test at the DRC, your test appointment must also be made with them at least one week prior to the test.

**Please be aware that grades posted at the end of the semester are final and are not a starting point for negotiations. Please respect this and do not email your instructor requesting “special consideration”. The same grading policy will be applied to all students, without exceptions.**

## **Well-being, Mental Health, and Student Support**

If you or someone you know needs assistance, you are encouraged to contact Student Care & Outreach in the Division of Student Affairs at 706-542-7774 or visit <https://sco.uga.edu/>. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.

UGA has several resources to support your well-being and mental health: <https://well-being.uga.edu/>

Counseling and Psychiatric Services (CAPS) is your go-to, on-campus resource for emotional, social and behavioral-health support: <https://caps.uga.edu/>, TAO Online Support (<https://caps.uga.edu/tao/>), 24/7 support at 706-542-2273. For crisis support: <https://healthcenter.uga.edu/emergencies/>.

The University Health Center offers FREE workshops, classes, mentoring and health coaching led by licensed clinicians or health educators: <https://healthcenter.uga.edu/bewelluga/>

## Course Schedule

The following is a schedule of course topics and deadlines for reading assignments, weekly notes, homeworks, etc. All chapter references below are to the primary text: *Applied Calculus & Regression Analysis: University of Georgia Custom Edition* unless otherwise specified.

DATE	DAY	EVENT	TOPIC/READING ASSIGNMENT
Week 0: TOPIC: Syllabus & Course Overview			
08/18	R	Class Meeting	Syllabus
Week 1: TOPIC: Pre-Calculus Review & Intro to Functions			
08/23	TR	Class Meeting	Tan Section 1.1, 1.3-1.4, 2.1-2.2
08/26	F	HW 0 Due (EC)	
Week 2: TOPIC: Limits & The Derivative			
08/30	TR	Class Meeting	Tan Section 2.3, 2.4 & 2.6
08/31	W	HW 1 Due	
Week 3: TOPIC: Differentiation, Marginal Functions & Elasticity			
09/06	TR	Class Meeting	Tan Section 3.1, 3.2 & 3.4
09/07	W	HW 2 Due	
Week 4: TOPIC: Higher-Order Derivatives and Applications of the Derivative			
09/13	TR	Class Meeting	Tan Sections 3.5, 4.1, 4.2 & 4.4
09/14	W	HW 3 Due	
Week 5: TOPIC: Exponential and Logarithmic Functions & Multivariable Calculus			
09/20	TR	Class Meeting	Tan Sections 5.1, 5.2, 5.4, 5.5, 8.1 & 8.2
09/21	W	HW 4 Due	
09/22	R	Test 1 Sign-Up	Complete via link on eLC
Week 6: TOPIC: Partial Derivatives & The Normal Distribution			
09/27	TR	Class Meeting	Tan Section 8.2, Dielman Sections 2.1-2.4
09/28	W	HW 5 Due	
Week 7: TOPIC: Test 1 Review			
10/04	T	Class Meeting	Test 1 Review
10/05	W	HW 6 Due	
10/06	R	Exam 1	*Select your specific day/time via online survey on eLC by 10/2 at the latest.
10/07	F	Exam 1	
Week 8: TOPIC: Simple Linear Regression & Multiple Regression Review			
10/11	TR	Class Meeting	Dielman Chapters 3 & 4
Week 9: TOPIC: Simple Regression Regression & Multiple Regression Review			
10/18	TR	Class Meeting	Dielman Chapters 3 & 4 (continued)
10/21	F	HW 7 Due	



<b>DATE</b>	<b>DAY</b>	<b>EVENT</b>	<b>TOPIC/READING ASSIGNMENT</b>
<b>Week 10: TOPIC: Simple Regression Regression &amp; Multiple Regression Review</b>			
10/25	TR	Class Meeting	Dielman Chapter 3 & 4 (continued)
<b>Week 11: TOPIC: Curvilinear Models and Regression Assumptions</b>			
11/01	TR	Class Meeting	Dielman Chapters 5 & 6
11/02	W	HW 8 Due	
11/03	R	Test 2 Sign-Up	Complete via link on eLC
<b>Week 12: TOPIC: Indicator and Interaction Variables</b>			
11/08	TR	Class Meeting	Dielman Chapter 7
11/09	W	HW 9 Due	
<b>Week 13: TOPIC: Test 2 Review</b>			
11/15	T	Class Meeting	Test 2 Review
11/16	W	HW 10 Due	
11/17	R	<b>Exam 2</b>	*Select your specific day/time via online survey on eLC by 11/13
11/18	F	<b>Exam 2</b>	at the latest.
<b>Week 14: TOPIC: Variable Selection Procedures</b>			
11/22	T	Class Meeting	Dielman Chapter 8
<b>Week 15: TOPIC: Logistic Regression</b>			
11/29	TR	Class Meeting	Dielman Chapter 10
<b>Week 16: TOPIC: Final Exam Review</b>			
12/06	T	No Class	Tue operates on Fri schedule (we will have optional evening Zoom review)
12/06	T	HW 11 Due	

**The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.**

# Getting Started with Enhanced WebAssign!



## First Time Login - Note: There is no Class Key for BUSN 4000

You should access WebAssign directly from toolbar link provided at the top of the course eLC homepage (as shown). Signing in via the illustrated link will mean you will not be asked for a Class Key and will be taken straight to the BUSN 4000 WebAssign course (which will become available on the first day of classes).



There will be a two-week trial period, during which time you will need to purchase an access code in order to maintain access throughout the rest of the semester.

If you are having difficulty getting started with WebAssign, or in gaining access to the course, Cengage typically hold Virtual Zoom Support Hours during the initial weeks of the semester. This semester, these hours will take place at the following dates/times:

***Weekdays, starting August 15<sup>th</sup> – September 2<sup>nd</sup>  
Noon – 2pm EST***

The link to sign-in to these hours is [https://info.cengage.com/DTS\\_OfficeHours\\_Southeast](https://info.cengage.com/DTS_OfficeHours_Southeast)

If you can't make the Virtual Office Hours, you can also call the student support line at 1.800.354.9706. Make sure you tell the person helping you that BUSN 4000 uses D2L integration (if they ask for a class key).

## Grading in WebAssign:

**It is important to understand that work is recorded for grading ONLY when the work is SUBMITTED.**

Work is submitted by clicking the submit button. The number of submits allowed is limited to 3 FOR EACH NUMERIC RESPONSE, although multiple choice questions with limited choices allow fewer. Each submit will allow you to see which of the items were incorrect. Once the due date for any homework has passed, you will be able to re-enter the homework and view a solution key.

## Numerical Questions in WebAssign:

Each numerical question has bounds, or a range of answers that will be considered correct. This range will vary from question to question. In order to ensure that your final answer will be within the bounds specified, students should **carry out ALL intermediate calculations with no rounding.**