Raymond A. Mason School of Business
WILLIAM & MARY

BUAD5072	
Room: Miller Hall - Room:1027	
01 - Days: TR(F), Time: 9:30AM-10:50AM 02 - Days: TR(F), Time: 2:00PM-3:20PM	
Fall 2021 Syllabus	
Last Updated: September 17, 2021	
Course Dates: 09/20/2021 - 12/22/2021	
F2F Modality	
Instructor	Dr. Pamela Galluch Schlosser
Office	Miller 3010
Office Hours	On Zoom – T 4:00-5:00; MW 11:00-12:00
Phone	757-221-7415
Email	pamela.schlosser@mason.wm.edu
Emailing about the course	Prioritize the office hours before emailing so that you can get more detailed help. If you cannot make office hours, please remember that the main goal of emailing in the course is to ask questions. Make sure the email body is written in full sentences. When asking questions please be specific about what your question is. For example, *I'm having trouble understanding how to create a bar chart in R, here is an example I tried*. As opposed to, *my R file does not work*. I would encourage you to send me the code you are struggling with along with screen shots/videos of your work so I can make more valuable comments. Please take note that emails that include incomplete thoughts and sentences might be ignored.
Course Description	CRN:11917 -- Machine Learning 1 -- This is the first of two courses designed to equip students with the kinds of analytical skills used in the era of Big Data to reveal the hidden patterns in, and relationships among, data elements being created by internal transaction systems, social media and the Internet of Things. A family of analytical methods, collectively referred to as "Machine Learning" methods, has grown out of the Artificial Intelligence community and has become commonplace in many of the world's leading analytics competitors. This first course focuses on the basics of machine learning, regression techniques, classification techniques and how to avoid over-fitting predictive models. The R language is used extensively in this course.
Course Objectives and Learning Objectives	Broadly: To approach business problems analytically. • Think carefully and systematically about whether and how data can improve business performance. Specifically: To develop competency in machine learning methods through hands-on experience (using R). • Know the basics of the most common machine learning concepts, processes, and model-building techniques. In doing so, we will seek to understand the underlying algorithms for each technique.
Corequisites	BUAD 5012, BUAD5022, BUAD5032, BUAD5272

Textbook	An Introduction to Statistical Learning with Applications in R | Edition: 2 | Author: James et al. ISBN: 9781461471370 | Publication Date: 07/31/2013: ❖ Link to text: https://www.statlearning.com/ Link to datasets: https://www.statlearning.com/resources-first-edition
Program Requirements	RStudio, R Version > 4.0
Syllabus changes	This is a dynamic syllabus, meaning it may undergo change. This class will follow the rules and guidelines outlined by the university regarding best practices surrounding Covid-19. There is a chance that recommended protocols for delivering class material will change based on new information. In the event this happens, I will update our syllabus on Blackboard and inform you in class or via email. It is the student's responsibility for reviewing the syllabus for changes each week on Blackboard.
Attendance and Punctuality	Attendance is required and I will take attendance regularly. I expect you to be present and ready to begin work at the scheduled class start-time. Punctuality is very important as late arrivals or late entrants can be highly disruptive to the flow of the material. As such, absences and tardiness are treated equally. Please be considerate of your fellow students and make every effort to arrive on time and avoid leaving class once it has started. Unless an approved exception has occurred, students must keep the class time open for continual synchronous delivery in person all semester.
ADA Accommodation	William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2512 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see www.wm.edu/sas. Students must receive clearance from the Student Accessibility Office (SAS) before faculty are obligated to accommodate extra time on exams, etc. Accommodations must be double checked by the student and confirmed with the professor ***prior*** to any exam for correctness.
W&M Honor Code	The College of William & Mary has had an honor code since at least 1779. Academic integrity is at the heart of the College, and we all are responsible for upholding the ideals of honor and integrity. The student-led honor system is responsible for resolving any suspected violations of the Honor Code, and I will report all suspected instances of academic dishonesty to the honor system. The Student Handbook (www.wm.edu/studenthandbook) includes your responsibilities as a student and the full Code. Your full participation and observance of the Honor Code is expected. To read the Honor Code, see www.wm.edu/honor. All academic work in this course is to be your own.
Recording Class Sessions	Students are strictly prohibited from recording class sessions and other interactions with the instructor using any type of technology. Recordings and synchronous class sessions provided by the instructor are protected by both copyright and the Family Education Rights and Privacy Act (FERPA) and may not be shared or redistributed to anyone at any time now or in the future. To do so is both a violation of law and of W&M's Honor Code.
Notice of Copyright	All course materials, including the syllabus, lectures, presentations, recordings, quizzes, assessments, tests, exams, outlines, assignments, electronic files, and similar materials, for this course are protected by copyright and are the sole property of the course instructor. You may use these materials for your

	personal, non-commercial educational use. You may not, nor may you knowingly allow others, to reproduce or distribute any course materials publicly without the express written consent of the instructor. This includes providing materials to commercial course material suppliers such as CourseHero and other similar services. To do so is both a copyright violation and a violation of W&M's Honor Code.
Diversity and Inclusion	William & Mary welcomes students from around the country and around the world, and their unique perspectives enrich our learning community. It is our collective responsibility to create and foster an environment that is inclusive and respectful for all. To do this we must demonstrate: • Respect and responsibility for self and others • A spirit of generosity • A life dedicated to inquisitive learning and development • An acknowledgement that an individual's own words, actions, and relationships show a commitment to these values I would like to create a learning environment that supports a diversity of thoughts, perspectives and experiences, and honors your identity. To help accomplish this, please notify me: • If you have a name and/or set of pronouns that differ from those that appear in your official W&M records. • If you feel like your performance in the class is being impacted by your experiences outside of class. • If something was said or done in the classroom, by either myself or another student, that causes discomfort or offense.
Face Mask Policy	Please do your part in keeping our university community safe. Per university policy, wearing of face mask is required in all public or communal spaces including classrooms until further notice. This face mask must fully cover your mouth and nose. Although students and faculty normally interact in close proximity during class, especially just before and just after class at or near the podium, that will not be possible this semester. To better accommodate our need to be in close proximity to review assignments or assist in solving technology issues, office hours will be held via Zoom to allow screen sharing.
Technology Policy	Use of technology can have a tremendous, positive impact on your learning. It can also have a strong, negative impact on your and your colleague's learning. Laptops should be brought to every class. During the in-class assessments, exercises, and practice, students will be using laptops. Only applications directly relevant to the coursework will be allowed. Other devices, such as mobile phones, are not to be used at any time in class. To remove temptation and misunderstandings, your mobile phones should be on silent and placed in your bag, not out in the open.
Recommended Equipment	Because you will be remote for at least some portion of this course due to social distancing requirements, I strongly advise you to obtain a secondary monitor to work effectively in the course. This is because one monitor will need to be used to receive my shared screen which will contain multiple windows and there is simply not enough space on your laptops to then split my shared screen with your own version of software we are using to work along with me. The plan, therefore, is to have one monitor to view my shared screen and the other monitor for your own software. External monitors (try to get a 24 to 27 inch one) are inexpensive to purchase, but you may also use a high-definition television for this second monitor. This second monitor will come in handy for

	any other hybrid or remote courses you take. You should also have a quality headset (preferable noise cancelling) with a built-in microphone to use while on Zoom both in and outside of class.
Dress Code	ML1 follows the dress code outlined by the MSBA program: Business Casual: The expected dress is long khaki pants and a button-down shirt, or dress of comparable formality. Casual Friday: formality of dress is relaxed on Friday, although attire should never be distracting, sloppy, or too revealing. For example, jeans and a polo shirt are acceptable: athletic shorts, pajamas, and sweatpants are not. Guest Speakers: dress is business causal on any day on which we are hosting a guest speaker.
Case Study Policy	There are 4 category B case studies: a group assignment. These case studies will be completed asynchronously within the window allowed and stated on Blackboard. These case studies must be completed and submitted through Blackboard by the due date in the system unless an approved accommodation is made in advance. Absolutely no case studies will be accepted via email unless directly requested by the instructor. Category B – A group assignment. Your group may not receive help from anyone outside your group. All questions concerning this assignment should be addressed to your professor. It is an honor code offense to give help to other groups and individuals or receive assistance from other groups and individuals. Exceptions to Case Study policy may include a documented University activity or a documented emergency situation beyond the student's control. This documentation must be received through the dean of student's office or SAS. The dates are set on the last page of the syllabus for these assignments. If a documented exception is made for one person in a group, and that group member was unable to contribute, the remaining group members should submit their group assignment on time and the person with the approved accommodation will require a separate individual assignment.
Attendance and Participation	Attendance will be taken regularly and punctuality is expected. At various class times, participation exercises will be given to ensure attentiveness. If recommended swirl exercises are completed during class time, they will count towards your participation grade. Other activities completed during class time will also count towards participation and attendance is required to receive completion credits. Swirl exercises will be open note/open book, and are designed as checks **to test for active learning of the material.** These exercises are to be taken in R using the swirl package. You may take these swirl exercises as many times as you want in R to practice outside of class.
Examinations	Exams: There will be one midterm and one cumulative final exam delivered during the scheduled block time. These exams will cover all assigned textbook readings, R scripts, and in-class material. All work must be shown on programming problems in order to receive credit. In other words, if you do not show your work, you may not receive any credit, even if your answer is correct.

Grading Policies and Procedures						
Grade Components						
Case Studies	32%					
Attendance and Participation	8%					
Midterm	30%					
Final Exam	30%					
Total	100%					
Grading Point System						
Grade	Greater than or equal to	Less than		Grade	Greater than or equal to	Less than
A	95%	---		C+	77%	80%
A-	90%	95%		C	73%	77%
B+	87%	90%		C-	70%	73%
B	83%	87%		F	---	70%
B-	80%	83%				

Week	Day	Description	Chapter	Recommended Swirl Exercises	Deliverables
Week 4	21-Sep	Syllabus Introduction and Expectations			
	23-Sep	Defining Statistical Learning and the Scientific Understanding of Behavior	1	Vectors	
Friday Session	24-Sep	Basic Concepts and Vocabulary	2.1	Matrices	
Week 5	28-Sep	Getting Started with R and Rstudio	2.3	Base_Graphics	
	30-Sep	Loading Data	2.2	Loading_Data	
Friday Session	1-Oct	Assessing Model Accuracy			Case 1
Week 6	5-Oct	Linear Regression (Simple)	3.1/3.6.2	Simple_Linear _Regression	
	7-Oct	Linear Regression (Multiple)	3.2/3.6.3	Multiple_Linear _Regression	
Week 7	12-Oct				
	14-Oct	Linear Regression (Interaction Terms)	3.6.4	Regression_with _Interaction	Case 2
Week 8	FALL BREAK	19-Oct			
	21-Oct	Non-linear Transformation of the Predictors	3.6.5	Non-Linear	
Friday Session	22-Oct	9:30-11:30AM for all students			Midterm
Week 9	26-Oct	Qualitative Predictors	3.6.6	Qualitative_Predictors	
	28-Oct	Other Considerations in the Regression Model	3.3.1-...2		
Friday Session	29-Oct	Potential Problems with Regression Models	3.3.3-...6		
Week 10	2-Nov				
	4-Nov	Classification and Logistic Regression	4-4.3		Case 3
Week 11	9-Nov			Logistic_Regression	
	11-Nov	Linear Discriminant Analysis	4.4		
Week 12	16-Nov			Linear_Discriminant _Analysis	
	18-Nov	A Comparison of Classification Methods	4.5		
Week 13-Asynch	23-Nov	Lab and K-Nearest Neighbors	4.6	K-Nearest_Neighbors	
Thanksgiving Break					
Week 14	30-Nov	Resampling Methods	5.1		
	2-Dec				Case 4
Week 15	7-Dec	The Bootstrap and Lab	5.2-.3	Validation	
	9-Dec				
Final	16-Dec	Final Exam Due by End of Exam Period			Final Exam