



COLLEGE OF WILLIAM & MARY
Mason School of Business
BUAD 5012: Competing Through Business Analytics
Fall 2017

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	Section 1	Section 2
Meeting Times	MWF, 9:30 a.m.–12:20 p.m. (1088)	MWF, 2:00 – 4:50 p.m. (1088)
(Rooms)	TTh, 8:00 – 10:50 a.m. (1027)	TTh, 12:30 – 3:20 p.m. (1027)
Meeting Dates	August 30 – September 15	

Course Materials

- **Course Materials:** a majority of the course materials for this course will be provided to students free of charge via the course web page and Internet links which are either materials that the instructor has written or that come from the databases to which the College of William and Mary subscribes. The other course materials are as follows:
 - **Course Packet:** the course packet is available from Harvard Business School Publishing by visiting this web page:
<http://cb.hbsp.harvard.edu/cbmp/access/65488056>
 The packet cost is minimal: \$4.25.
 - **Book:** *Automate This!*, by Christopher Steiner, ISBN: 978-159184-492 (hardcover), 978-1-59184-652 (paperback)
- **Course Web Site:**
 This course will use Blackboard to distribute materials besides the book and course packet mentioned above, information, assignments, and for submitting most assignments.

Course Topics

This course is an introduction to the Masters of Science in Business Analytics Program and an introduction to the process of conducting a business analytics project. Those goals are accomplished through content that follows four threads:

- The Analytics Process
- Business Context/Acumen
- Essential Analytics Skills
- Issues in Analytics

The Analytics Process is introduced using the CRSP-DM framework and experienced through in-class exercise.

Business Acumen or an understanding of the business Context in which analytics are done is essential for the results to be relevant and valuable to the business. A series of guest speakers, case studies, and other sessions introduce students to how managers are measured and how they are motivated, how business is done in various industries and functional areas, and the types of problems to which business analytics are applied.

This course will address certain Essential Analytics Skills that are not covered elsewhere in the program. These include learning data structures including HTML, XML, and JSON: this session sequence also includes an introduction to various methods for scraping data from the Internet. We will also cover basic visualization skills with Python. This course will provide the first experience in presentation skills.

The primary Issues in Analytics that we will address are data security, confidentiality, and ethics, which are essential topics for their ethical and legal implications.

Homework Assignments and Grading

Assignments are listed below in order of due date. Please allow some flexibility in adjusting the due dates as we progress through the material at a stochastic rate.

Competing Through Business Analytics

Homework Assignments and Grading

Assignment	Type	Due Date		Assignment Category	Rubric
Seven Eleven Japan Case	T	8/30	5%	B	Q
Optimization Case Questions	T	9/10	5%	B	Q
XML Web Scraping Assignment	I	9/8	10%	C	A
HTML Web Scraping Assignment	I	9/10	10%	C	A
JSON Web Scraping Assignment	I	9/11	10%	C	A
Ethics/Security/Confidentiality Presentation	T	9/12	15%	B	P
Lessons Learned	I	9/14	10%	C	E
Automate This!	I	9/14	10%	C	Q
Storytelling & Visualization Assignment	I	9/15	15%	C	P
Class Participation	I	N/A	10%	N/A	

Legend: T = Team Assignment; I = Individual Assignment

All assignments should be submitted electronically to Blackboard. Unless otherwise noted in the syllabus, assignments are due at 11:59 p.m. on the dates listed in the table above.

Each assignment will be graded out of 100 points. The final weighted grade out of 100 points will be computed using the weights noted in the table above. Letter grades will be assigned based on this scale:

Final Weighted Grade Average (FWGA)	Grade
$93 \leq \text{FWGA} \leq 100$	A
$90 \leq \text{FWGA} < 93$	A-
$87 \leq \text{FWGA} < 90$	B+
$83 \leq \text{FWGA} < 87$	B
$79 \leq \text{FWGA} < 83$	B-
$76 \leq \text{FWGA} < 79$	C+
$73 \leq \text{FWGA} < 76$	C
$70 \leq \text{FWGA} < 73$	C-
$\text{FWGA} < 70$	F

Assignment Rubrics

Assignments fall into the four categories below, each with its own grading rubric that for assigning grades on a 10-point scale. The table above specifies which rubric applies to each assignment.

Analytics Assignments (A)

Points	Criteria
100	The assignment questions were addressed thoroughly and any code that was written works and creates appropriate output that answers the questions that were posed. All written answers are grammatically correct and succinct.
92	Some answers were not as complete as they might have been, or significant typographical and grammatical errors exist in written answers, or there are relatively minor errors in analysis and written code.
80	The solution was somewhat on track, but some major points were not understood or code does not successfully create the appropriate output.
70	The assignment shows some, but not much understanding of the methodologies discussed in class, or there are major flaws in the code either logically or syntactically.
0	No evidence exists that any of the methodology in class was understood.

Qualitative Assignments (Q)

Points	Criteria
100	Written answers are comprehensive, logically presented, use all of the support evidence from the reading, and are presented in a grammatically correct and succinct manner.
92	Minor deficiencies were evident in the dimensions noted in the statement characterizing a score of 100.
80	Major flaws in logic, presentation, completeness, or grammar were evident although the work did still contain substantial relevant content.
70	The assignment demonstrates a lack of effort and major flaws in the criteria noted in the statements above although it still contains some relevant arguments.
0	No evidence of significant effort.

Assignments involving Presentations (P)

Points	Criteria
100	The deliverables satisfactorily answered the research posed in the assignment or the research question devised by the authors. In the latter case, the research question was appropriate. The presentation storyboard had no logical flaws. The recommendation and/or conclusions were well supported by as much data and analysis as was possible within the constraints of the assignment (time and page limits). There were no typographical errors. Presentation slides were clear and not overly congested. Visualizations effectively communicated the intended message.
92	A couple typographical errors or a single error of greater magnitude such as overly congested slides or visualization that were coherent but lacking in some way.
80	Major flaws in logic, presentation, completeness, or grammar were evident although the work did still contain substantial relevant content.
70	The assignment demonstrates a lack of effort and major flaws in the criteria noted in the statements above although it still contains some relevant arguments.
0	No evidence of significant effort.

Class Participation

Class participation scoring will be based on how well you have interacted meaningfully in class with the professor and other students; thus, if you say nothing or say very little, you are not successfully participating. Meaningful interaction includes, but need not be exclusively one of the following: answering my difficult questions, relating insightful observations, or posing a *question* that provokes useful analysis or consideration of issues. Faithful attendance, obviously, factors into your class participation grade.

Academic Integrity:

Academic integrity is an integral component of the College of William and Mary learning experience and any breach of this integrity is very serious and not in keeping with the overall intellectual and ethical foundations of our University. Students are expected to adhere to the College of William and Mary Honor Code and to the general principles of academic honesty. These principles include and incorporate the concept of respect for the intellectual property of others, the expectation that assignments will be submitted according to guidelines specified by the instructor, and that plagiarism of any type is unacceptable.

Within the Raymond A. Mason School of Business, we have developed an Assignment Code and every assignment in this course will be given a code letter(s). If there are questions related to how an assignment is to be carried out, it is essential that you ask your professor for clarification. The code is as follows:

Category A – This is an individual assignment. You may not receive help from anyone on this assignment. It must be 100% your own work. All questions concerning this assignment should be addressed to your professor. It is an honor code offense to give or receive assistance on this assignment.

Category B – This is a group assignment. Your group may not receive help from anyone outside your group. While your group may choose to delegate the work among the group members, everyone in the group is expected to be prepared to discuss the entire assignment in class. 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.

Category C – This is an individual assignment. You may work with others or receive help from a tutor on this assignment. You must, however, turn in your own paper. You may not divide the work with others or copy another student's paper; it is an honor code offense to do so.

Category D – This is a group assignment. You may share information, discuss general concepts and approaches to the assignment with other groups. You may receive help from a tutor. Everyone in the group should be prepared to discuss the entire assignment in class. Each group must turn in their own work. You may not copy another group's work; it is an honor code offense to do so.

Category E – This is a timed assignment. You are given a specific length of time within which the work must be completed. It is an honor code offense to violate this time restriction unless you have received permission from your professor.

Teams

Teams have been preassigned and are noted in the course Blackboard site.

Course Policies

- You are expected to have read the assigned material for each class and to be ready to discuss it in class. You are expected to participate in class discussion.
- See the Orientation materials for details on these classroom policies:
 - ⇒ Honor Code
 - ⇒ Attendance
 - ⇒ Submitting assignments
 - ⇒ Dress Code
 - ⇒ Team work and 360-degree evaluation
 - ⇒ Staying seated in class
 - ⇒ Use of laptops and phone during guest speaker sessions

ADA Accommodation

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels s/he may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2509 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please see <http://www.wm.edu/sas>.

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Course Schedule

Session	Date	Section 1		Section 2	
		Time	Topic	Time	Topic
1	8/30	9:30	Introduction to Business Analytics	2:00	Introduction to Business Analytics
2	8/30	11:00	Multiple Topics: <ul style="list-style-type: none"> Introduction to CTBA File Backup and Google Drive 	3:30	Multiple Topics: <ul style="list-style-type: none"> Introduction to CTBA File Backup and Google Drive
3	8/31	8:00	Seven Eleven Japan Case Discussion	12:30	Seven Eleven Japan Case Discussion
4	8/31	9:30	Storytelling & Visualization 1	2:00	Storytelling & Visualization 1
5	9/1	9:30	Storytelling & Visualization 2	2:00	Storytelling & Visualization 2
6	9/1	11:00	Storytelling & Visualization 3	3:30	Storytelling & Visualization 3
7	9/4	9:30	Storytelling & Visualization 4	2:00	Storytelling & Visualization 4
8	9/4	11:00	Storytelling & Visualization 5	3:30	Storytelling & Visualization 5
9	9/5	8:00	Data Structures & Web Scraping 1	12:30	Data Structures & Web Scraping 1
10	9/5	9:30	Data Structures & Web Scraping 2	2:00	Data Structures & Web Scraping 2
11	9/6	9:30	Data Structures & Web Scraping 3	2:00	Guest Speaker: Eddie Davis, FedEx
12	9/6	11:00	Guest Speaker: Eddie Davis, FedEx	3:30	Data Structures & Web Scraping 3
13	9/7	8:00	Data Structures & Web Scraping 4	12:30	Guest Speaker: Carol Woody, Cybersecurity
14	9/7	9:30	Guest Speaker: Carol Woody, Cybersecurity	2:00	Data Structures & Web Scraping 4
15	9/8	9:30	Data Structures & Web Scraping 5	11:00	Guest Speaker: Dawn Klinghoffer, Microsoft People Analytics
16	9/8	11:00	Guest Speaker: Dawn Klinghoffer, Microsoft People Analytics	2:00	Data Structures & Web Scraping 5
17	9/11	9:30	Optimization Article Discussion	2:00	Optimization Article Discussion
18	9/11	11:00	Lean Introduction	3:30	Lean Introduction
19	9/12	9:30	Lean Application	11:00	Guest Speaker: Michael Antony Raj, Verizon
20	9/12	11:00	Guest Speaker: Michael Antony Raj, Verizon	12:30	Lean Application

21	9/13	9:30	Data Confidentiality, Data Security, & Ethical Use of Data and Analytics 1	2:00	Data Confidentiality, Data Security, & Ethical Use of Data and Analytics 1
22	9/13	11:00	Data Confidentiality, Data Security, & Ethical Use of Data and Analytics 2	3:30	Data Confidentiality, Data Security, & Ethical Use of Data and Analytics 2
23	9/14	8:00	Git & Github	12:30	Guest Speaker: David Burg, PwC
24	9/14	9:30	Guest Speaker: David Burg, PwC	2:00	Git & Github
25	9/15	8:00	Multiple Topics: <ul style="list-style-type: none"> • AutomateThis! Discussion • Lessons Learned Discussion 	10:00	Multiple Topics: <ul style="list-style-type: none"> • AutomateThis! Discussion • Lessons Learned Discussion
26	9/15	9:30	Wrap-up	11:40	Wrap-up

Session Descriptions

Topic	Readings, Assignments, Description, and/or Preparation (Empty cells indicates no preparation.)	Component
Introduction to Business Analytics	<ul style="list-style-type: none"> • Readings <ul style="list-style-type: none"> ○ https://publicinterestlegal.org/blog/scores-of-counties-put-on-notice-about-corrupted-voter-rolls/ ○ http://publicinterestlegal.org/county-list/ ○ https://hbr.org/2016/12/why-youre-not-getting-value-from-your-data-science 	Process
Intro. to the CTBA Course	This is an introduction to the course and its logistics.	
File Backup & Google Drive	I will show you how to set up an access a Google Drive account with unlimited storage.	
Seven Eleven Japan Case Discussion	<ul style="list-style-type: none"> • Preparation <ul style="list-style-type: none"> ○ We will discuss the Seven Eleven Japan Case in this session ○ See the syllabus for these items: <ul style="list-style-type: none"> ▪ Assignment ▪ Link to purchase the case from Harvard Business School Publishing 	Context, Process
Storytelling & Visualization 1	<ul style="list-style-type: none"> • Preparation for class: <ul style="list-style-type: none"> ○ Prepare your team's responses to the questions posed in the slides of the lecture PowerPoint presentation entitled StoryTellingVisualization1.pptx, which is located here on the course Blackboard site: 	Skills

	<ul style="list-style-type: none"> ▪ Lecture Material > Storytelling & Visualization ○ The slides assigned to each team can be found in the file Storytelling&VisClassPrepAssign.pdf, which is located in the same content area in the course Blackboard site as listed above. 	
Storytelling & Visualization 2	An introduction to the Python graphing packages matplotlib and seaborn.	Skills
Storytelling & Visualization 3	We will continue discussing matplotlib and seaborn from the preceding session. We will entertain questions on the Storytelling Assignment, if time permits.	Skills
Storytelling & Visualization 4	We will discuss presentation storyboards or, in other words, how to structure an effective presentation.	Skills
Storytelling & Visualization 5	<p>We will conclude the Storytelling and Visualization component in this session. We will entertain questions you have on the Storytelling Assignment, if time permits. In addition we will also discuss this article:</p> <ul style="list-style-type: none"> ○ https://www.forbes.com/sites/brentdykes/2016/03/31/data-storytelling-the-essential-data-science-skill-everyone-needs/#3647f97252ad 	Skills
Data Structures & Web Scraping 1	This series of five sessions covers popular data formats, including HyperText Markup Language (HTML), eXtensible Markup Language (XML), and JavaScript Object Notation (JSON). These sessions also provide tutorials on how to acquire such data from the Internet using web scraping.	Skills
Data Structures & Web Scraping 2		
Data Structures & Web Scraping 3		
Data Structures & Web Scraping 4		
Data Structures & Web Scraping 5		
Optimization Article Discussion	<p>We will discuss the optimization case assignment. Here's the preparation:</p> <ul style="list-style-type: none"> ○ Read this article which is on the course Blackboard site: <ul style="list-style-type: none"> ▪ The Simultaneous Planning of Production, Capacity, and Inventory in Seasonal Demand Environments, by James R. Bradley and Bruce C. Arntzen, Operations Research, 1999, Vol. 47, No. 6, 795-806. ○ Complete the assignment, which is also on the Blackboard course site ○ Comment: <ul style="list-style-type: none"> ▪ Do not worry if you do not understand some of the technical terms in this article. You may skim those parts of the article while trying to 	Context Skills

	note the acronyms and names of software tools. Much of the article is written in readable English, however, and describes the analytics process, characteristics of the data, an important business context, and how managers thought about the problem being solved.	
Dawn Klinghoffer, Microsoft People Analytics, Guest Speaker	<p>Read these articles:</p> <ul style="list-style-type: none"> • http://www.forbes.com/sites/joshbersin/2015/02/01/geeks-arrive-in-hr-people-analytics-is-here/3/#7129fdc93e3c • https://www.washingtonpost.com/business/people-analytics-moneyball-for-human-resources/2014/08/01/3a8fb6ac-1749-11e4-9e3b-7f2f110c6265_story.html • http://www.eremedia.com/tlnt/how-google-is-using-people-analytics-to-completely-reinvent-hr/ 	
Lean Introduction	This is an introduction to business process improvement using a method called Lean.	Context Skills
Lean Application	<p>We will apply the Lean methodology to two business processes in this session. The first context will be contained in the lecture slides and no preparation is required. Read this case for the second discussion, which is posted in the Reading content area of the course Blackboard site:</p> <ul style="list-style-type: none"> • ProcessImprovementWindEnergy.pdf 	Context Skills
Guest Speaker: Carol Woody, Cybersecurity	<p>Ms. Woody is a cybersecurity expert and an alumna of the college of William and Mary. She leads the Cyber Security Engineering (CSE) Team in the Cybersecurity Engineering Team (CERT) Division of the Software Engineering Institute (SEI), a research center for the U.S. Department of Defense at Carnegie Mellon University, focusing on building capabilities in defining, acquiring, developing, measuring, managing, and sustaining secure software for highly complex networked systems as well as systems of systems http://www.cert.org/cybersecurity-engineering/. She is also a principal investigator for research in cybersecurity risk management, software assurance, and supply chain security management. She also develops and teaches courses for executives and security specialists.</p>	
Michael Antony Raj, Verizon, Guest Speaker	Mr. Raj received an MBA in 2010 from the Raymond A. Mason School of Business at the College of William and Mary. He current is manager of an analytics group at Verizon.	

Confidentiality of Data, Data Security, and Ethical Use of Data and Analytics 1	<p>Teams will present their assigned topics in these two sessions:</p> <ul style="list-style-type: none"> • See the assignment posted on the course Blackboard site for details on your team's presentation. 	Context, Skills
Confidentiality of Data, Data Security, and Ethical Use of Data and Analytics 2		
Git & Github	This session will introduce you to Git and Github.	Skills
Guest Speaker, David Burg, PwC	Mr. Burg is a principal in PwC's U.S. Advisory practice and PwC Global and US Advisory Cyber Security Leader. He assists clients in reactive and proactive consulting capacities involving the deployment of information technology solutions and their use. Mr. Burg is responsible for helping corporate clients, law firms, and the US Government, in matters involving cybercrime investigations, complex data correlation/analysis, and various business transformation or operational initiatives. He is based in PwC's office in McLean, VA.	
Guest Speaker, Sam Ochs-Fisher, Stacy Voccia, FedEx	As of the publication of this syllabus, we have not been able to coordinate Ms. Ochs-Fisher's calendar with the course schedule. She may well appear as a guest speaker in the MSBA Program after the CTBA course is over.	
AutomateThis! Discussion	We will discuss the AutomateThis! Assignment. See the assignment on the Blackboard course site.	Context Skills
Lessons Learned Discussion	<p>Do the following in preparation for this session:</p> <ul style="list-style-type: none"> • Prepare your Lessons Learned Assignment for submission. • As you finalize the content in your response to that assignment, determine which three lessons or skills from this course you think are most significant. Your criteria may include which topics you think will be most useful in your career, which topics changed the way you think most significantly, or which topics were the most fun and interesting, or some combination of those criteria. 	
Wrap-up	We will summary the course, talk about your biggest takeaways, and give any last minute help that is needed on the Storytelling * Visualization Assignment.	Process