

Welcome from Faculty Director

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Welcome
&
Congratulations

Overview

- **Faculty**
- **Curriculum**
- **Program Policies**
- **Journey**
- **Advice**

“Somewhere behind the athlete you've become and the hours of practice and the coaches who have pushed you is a little girl who fell in love with the game and never looked back ... play for her.” – Mia Hamm



Fall Faculty

Introduction



Jim Bradley
CTBA



Alejandro Gelves
Stochastic Models



Scott McCoy
Excel Skills



Pamela Schlosser
Machine Learning 1



Monica Tremblay
Database Management



Joe Wilck
Optimization

Spring
Faculty

Introduction



Paul Blossom
Artificial Intelligence



Arturo Castellanos
Big Data



Rachel Chung
Machine Learning 2



Matt Dean
Heuristics



Seth Li
Data Visualization





Faculty

Introduction

Your Success is Our Passion

Our backgrounds are all in fields that spawned the data analytics movement ... Operations Research, Information Technology, Statistics, Computer Science, Artificial Intelligence, Mathematics, Engineering, ...

...BUT with practical experience

Manufacturing, transportation, software development, computer infrastructure, cybersecurity, military (defense/national security), oil & gas, healthcare, marketing analytics, consumer engagement, telecommunications, ...

Bottom Line: We value relevant, practical techniques that deliver business value



Curriculum

Context

What reasoning abilities or intellectual habits do analysts need to possess to develop or answer questions raised in business?

Recognize that conclusions/decisions must be made in the **absence of complete information.**

Curriculum

Visualization (Tableau, Excel, Python, R), Presentation Practice, Capstone Project

Business Acumen

Metrics, How Managers Think, What Decisions are Made, Industry Familiarity, Ethics, Organizational Dynamics, Implementation, Terminology

Pillars

Communicating with Impact

Computing Technologies

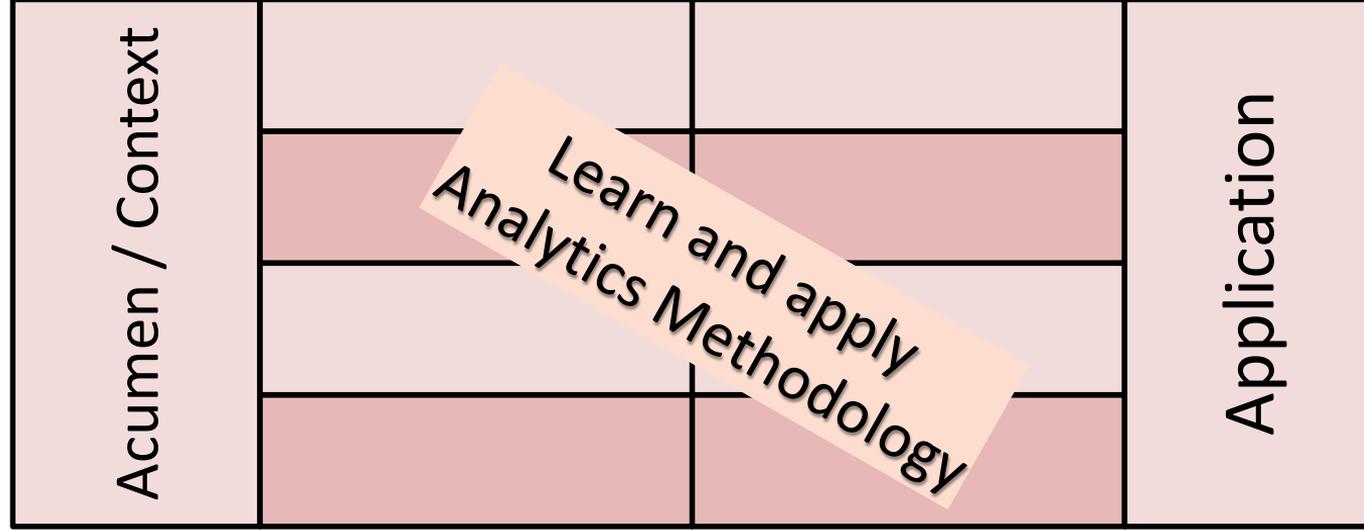
Stochastic Models, Machine Learning, Optimization, AI, Neural Networks, Algorithms

Mathematical Modeling

SQL, ETL, Dashboards, Big Data, Programming Solutions (R, Python), Webscraping

Curriculum

Bookends



Curriculum

Cutting Edge

Prerequisites	Fall (15 credits)		Spring (15 credits)		
			Capstone Preparation		
<ul style="list-style-type: none"> • Probability & Statistics • Linear Algebra • R and Python Programming • Business Foundations 	Competing Through Business Analytics (3 credits) 2 weeks	Database Management 3 credits, 13 weeks	Big Data 3 credits, 12 weeks		
		Stochastic Models 3 credits, 13 weeks	Heuristic Algorithms 1.5 credits, 6 weeks	Data Visualization 1.5 credits, 6 weeks	Capstone (3 credits) 3 weeks
		Machine Learning 1 3 credits, 13 weeks	Machine Learning 2 3 Credits, 12 weeks		
		Optimization 3 credits, 13 weeks	Artificial Intelligence (Neural Networks) 3 Credits, 12 weeks		



Curriculum

How did we get here?

- Planning
- Forethought
- What lack of knowledge on a topic would embarrass us if one of our graduates did not know it in the workplace ...
- Advisory Board (Alumni and Regional Partners)
(Google “William and Mary MSBA Advisory Board”)
https://mason.wm.edu/about/boards/business_analytics/index.php
- Employer Feedback
- Alumni Feedback
- Faculty Feedback (and new Faculty)
- Continuous Improvement



Curriculum

- Python
- R
- Alteryx
- Tableau
- Gurobi
- Excel

By the time you graduate, you will have 1000+ hours of R experience and 1000+ hours of Python experience ... {Feel free to say this in an interview.}

Software

- Packages within R and/or Python
 - Artificial Intelligence
 - Big Data (including on AWS)
 - Heuristics
 - Machine Learning
 - Neural Networks
 - Optimization
 - Visualization
 - Webscraping

Note, a Windows-based machine is needed!



Curriculum

Program Design

- Mathematical Modeling and Computing Technologies: Direct application to courses
- Business Acumen
 - Competing Through Business Analytics
 - Guest Speakers (especially in CTBA)
 - Real or realistic data sets and problems
 - “Story time” for context of the analysis
 - Capstone projects
- Communicating with Impact
 - Practice, practice, practice
 - Teamwork
 - Many opportunities in the MSBA



Curriculum

Summary

- Strong quantitative program achieved through admission and pre-requisites. (Congratulations again!)
- Communicating with impact and business acumen are reinforced strategically throughout the program through selection of assignments, team work, presentations, applied material
- Context → Analytic Methodologies → Application
- Graduates are well-prepared for analytic roles ...



Program Policies

Own It!

- Professionalism
 - Honor Code
 - Grade Penalties for Late Assignments
 - Dress Code
 - Punctuality
 - Compartment
 - Group Work
- Grading Scale
 - A \geq 95
 - 94.99 \geq A- \geq 90
 - 89.99 \geq B+ \geq 87
 - 86.99 \geq B \geq 83
 - 82.99 \geq B- \geq 80
 - 79.99 \geq C+ \geq 77
 - 76.99 \geq C \geq 73
 - 72.99 \geq C- \geq 70
 - 69.99 \geq F

Standard Policies (MSBA on left, assignment categories right):



Adobe Acrobat
Document



Adobe Acrobat
Document



Program Policies

Own It!

Professionalism

- Honor Code
- Penalties for Late Assignments
 - 20% if late
 - More than 3 days late receive a grade of 0
 - Once solutions are posted, then no credit available
- Dress Code
 - Business Casual (Including Zoom)
 - Casual Fridays (Jeans & Polo are fine, pajamas/sweatpants not fine)
 - Guest Speakers: business casual (even if a Friday)
- Punctuality
 - If you are late, then you are absent
 - Absences and tardiness can result in grade reductions (2% per occurrence, after the 3rd occurrence) in a course
 - Attendance will be taken
- **Comportment**
 - Stay seated during class
 - Stay off phone during class
 - Guest Speakers get your full attention
 - Do not take pictures of guest speakers' material!
- **Group Work**
 - Team contracts
 - If a team member is not performing, then talk to Julie Hummel
 - Team members can be fired

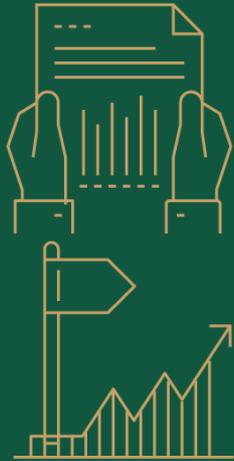
Bluetooth Device Warning!

Bluetooth headsets (if applicable) need to be PAIRED prior to entering the classroom, to avoid interfering with other students' devices.



Journey: Career Outlook

Data has been called the backbone for 21st century business decisions, which underscores the value of well-trained data practitioners. But why else should you consider this role?



- #1 Best Job in America¹
- Top 10 Highest Paying Jobs in the U.S.²
- \$110,000 median base salary³
- 28% expected rise in demand⁴
- 2.7 million openings for U.S. data professionals, including data scientists, developers and engineers expected by 2020⁵

1. Retrieved on February 28, 2018, from [glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm](https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm)

2. Retrieved on March 21, 2018, from [cnbc.com/2017/09/18/10-highest-paying-jobs-in-the-us-right-now.html](https://www.cnbc.com/2017/09/18/10-highest-paying-jobs-in-the-us-right-now.html)

3. Retrieved on February 28, 2018, from [glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm](https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm)

4. Retrieved on February 28, 2018, from [forbes.com/sites/louiscolombus/2017/05/13/ibm-predicts-demand-for-data-scientists-will-soar-28-by-2020/](https://www.forbes.com/sites/louiscolombus/2017/05/13/ibm-predicts-demand-for-data-scientists-will-soar-28-by-2020/)

5. Retrieved on March 21, 2018, from <https://blog.linkedin.com/2016/10/20/top-skills-2016-week-of-learning-linkedin>

Journey

Right now!

1. Work hard in the MSBA to acquire skills
2. Determine your target positions and industries
3. Become aware of your competencies (and deficiencies)
4. Develop target positions and industries for the future
 - Set a career path, trajectory
 - (Punch through)



Journey

Consultant or Consulting Analyst

- Accenture, IBM, Booz Allen Hamilton, Alix Partners, Marathon

Advisory Services Analyst

- EY, Deloitte, PwC, KPMG

Company HQ/Division Analytics Department

- Capital One, Disney, Ferguson, Florida Blue, MetLife, Merkle, MITRE, Verizon

Your Career

Analytics-Based Companies

- comScore, WealthEngine

Finance

- Bank of America, Morgan Stanley, Stevens Capital Management, Vanguard

Public Policy

- IMF, World Bank



Journey

Your Career

Account Analyst

Analytics and Tech

Consultant

Applied Analytics Consultant

Associate Data Analyst

Business Analyst

Consultant

Data Analyst

Data Scientist

Data Scientist Consultant

eBusiness Analyst

Information Technology

Consultant

Jr. Data Engineer

Machine Learning Fellow

Sr. Business Analyst

Sr. Consultant

Solutions Analyst

Staff Computer Scientist

Technology Analyst





Journey

Moving
Target

Business Analytics is *rapidly evolving*.

Software, methodologies, skills, and positions

R vs SAS, Python vs Java, CPU vs GPU

Limited visibility of future opportunities

You'll have opportunities that don't now exist!

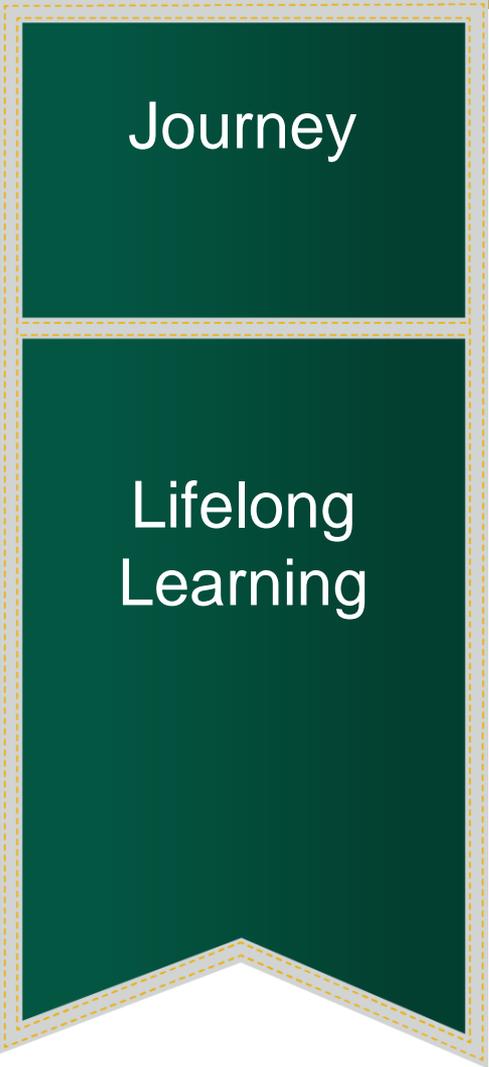
Your preferences will evolve with experience.

How do you cope?

Keep learning, create flexibility for yourself

Great news: There's a huge talent shortage.

You have a lot of latitude in shaping your career!



Journey

Lifelong
Learning

- Beware, you have signed up for a *Lifelong Learning Journey*
- But, since you're here, you probably view this as an exciting challenge, a beneficial aspect of your career:
 - Always something new to learn!
 - Those who learn will have the advantage!

Advice

We want to
help

- Your faculty and staff are here for you, we want to get to know you. Make the effort.
- Your classmates want to get to know you too. Make the effort.
- Get to know the faculty, staff, and each other. Make the effort.

Advice

Assignments

- Remember that assignments in analytics are not designed to be completed in one sitting. So, when you see deadlines coming up, that's not a signal to start working on an assignment--- (That works well in undergrad for some, but not grad school.)
- Faculty try to coordinate and stagger your deliverables when possible. Fall faculty meet regularly.
 - **But, due dates are not work dates.**

Advice

Assignment Variance

- On another note, beware that you might spend 20 hours on an assignment, and another team member or classmate spends only 5. It's OKAY. (Yes, it's fair.)
- (Your career rewards outputs, not inputs. You, however, will reap the benefits of your own inputs.)



Advice

Deadlines

- Deadlines are closer than they appear.
- You might be able to get an extension on an assignment, but it will help if you are wearing a sling or bandages.
- Emailing questions to the faculty member about an assignment right before it's due doesn't get an extension ...
 - It didn't work in 1990s either.



Advice

Opportunity

You have a number of tremendous opportunities here:

- You will get a world-class education
- You will make lifelong friendships
- You will progress on your career and enter a growing, beautiful, and diverse field (of analytics)
- You are surrounded by people who care about you
- Enjoy ... graduation will be here before you know it



Advice

Opportunity

Opportunity for Fall (that are outside of class):

Virginia Datathon (Free):

Sponsored by Library of Virginia and Chief Data Officer of Virginia

<https://www.cdo.virginia.gov/datathon/team-registration/>

Team Submissions by October 7-8

Email Dr. Joe Wilck (joe.wilck@mason.wm.edu) and Dr. Monica Tremblay (monica.tremblay@mason.wm.edu) if you are interested in joining a team.