Providing MSBA students opportunities to tackle your big data-driven, business analytics challenges
The STEM-designated MSBA program culminates with a spring capstone project building on students’ foundational training in the areas of **Data Science**, **Managing Big Data**, **Machine Learning**, and **Data Visualization**. Student teams apply these skills to solve sponsor firms’ business problems using the firm’s proprietary data, possibly integrating with public datasets. Deliverables include a robust technical handover package with empirical models, code and cleansed data, a business deck explaining the benefits and methodology, and an executive dashboard developed on a visualization platform such as Tableau.

**WHAT IS THE CAPSTONE PROJECT?**

1. **Business and 1 Technical Resource** – business context, problem clarification, data support
2. **Client-Consultant Interaction**
3. **Student Team**
   - 4-5 students work as a consulting team directly with the client
4. **Support**
   - Faculty (Academic)
   - Coaches (Professional)

“The interaction between students and the client is a critical success factor for both sides. We ensure the students have solid consulting and project management processes to follow, but having a passionate, engaged client is the most critical element in the equation. It provides the students with the right learning environment and also gives them the required domain knowledge to generate real outcomes from their code and recommendations.”

Scott Radcliffe, Managing Director, MSBA Program

“This capstone project was a great opportunity for all of us to learn more. While students had a chance to work on a real-world business problem and apply their hard-earned technical skills, we obtained an innovative product analytics framework that we plan to leverage later this year to double the revenue of our Black & Decker products on Amazon.”

Aleksandar Lazarevic, PhD, VP of Advanced Analytics and Data Engineering, Stanley Black & Decker
MSBA CURRICULUM OVERVIEW

WHY MSBA?
Emory University Goizueta Business School’s Master of Science in Business Analytics (MSBA) program imparts strong technical and quantitative training plus comprehensive business acumen, all within a top 20 business school.

“This intense program is purposefully designed to produce a business data scientist, one who can speak the language of business, technology, and data! We developed the program keeping in mind data-analytic needs across different functions in an organization as well as heterogeneity in sector-specific requirements. Our students will excel in any organization and in any function!”

Prof. Rannath K. Chellappa, Associate Dean & Academic Director, MSBA

MSBA CLASS OF 2021
KEY STATS
729 AVERAGE GMAT/GRE
54 STUDENTS ENROLLED
48% WOMEN
33% STUDENTS WITH WORK EXPERIENCE

SUMMER SEMESTER (0 CREDITS)
ISOM 660: MATH BOOTCAMP
ISOM 662: BUSINESS BOOTCAMP

PRE-FALL SEMESTER (3 CREDITS)
ISOM 661: TECHNOLOGY BOOTCAMP
ISOM 670: BUSINESS STATISTICS

FALL SEMESTER (15 CREDITS)
ISOM 572: INTRO TO BUSINESS ANALYTICS
ISOM 673: SOCIAL NETWORK ANALYTICS
ISOM 671: MANAGING BIG DATA
ISOM 674: MACHINE LEARNING I
ISOM 675: DATA VISUALIZATION

SPRING SEMESTER (15 CREDITS)
ISOM 676: MACHINE LEARNING II
ISOM 689: DECISION ANALYTICS & OPTIMIZATION
ISOM 677: MACHINE LEARNING II
ISOM 680: HUMAN RESOURCES ANALYTICS
MKT 680: MARKETING ANALYTICS
MKT 681: SPORTS ANALYTICS

- Full semester course
- Half semester course
- 0 credits

Bootcamp is 0-credit course
All other courses are 3 credits
**HOW THE PROJECT WORKS:**

<table>
<thead>
<tr>
<th>SPONSORS PROVIDE:</th>
<th>SPONSORS RECEIVE:</th>
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<tbody>
<tr>
<td>» A business problem requiring a combination of technical, business, and data science skills to solve</td>
<td><strong>Recruiting Access</strong></td>
</tr>
<tr>
<td>» Access to the firm’s data relevant to the business problem</td>
<td>Access for recruitment of MSBA students through our dedicated MSBA Career Center</td>
</tr>
<tr>
<td>» Commitment in the form of a business mentor and a technical resource to work closely with student groups and faculty advisor(s)</td>
<td><strong>Capstone Project</strong></td>
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<tr>
<td>» A tax deductible sponsorship as a gift to support the academic objectives of the MSBA Program to support student/faculty engagement and project deliverable</td>
<td>Opportunity to provide a data-based project for MSBA student teams using company-specific data and defined parameters for deliverables</td>
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**KEY DATES**

**NOVEMBER**  "Client Pitch Day" - sponsors present projects to students  
**DECEMBER**  PII removed from data as needed and data made accessible  
**JANUARY**  Initial client meeting day with student teams  
**FEBRUARY**  Formal mid-point reviews  
**APRIL**  Final presentations and deliverables due
**THE HOME DEPOT: A Highly-Scalable Solution to Identify Key Product Features and Keywords from Online Reviews to Improve In-Store Visual Designs**

**Business Problem:**
Today, The Home Depot is the world’s largest home improvement retailer with more than 2,200 stores across North America. An important driver of retail success is continuous in-store and online visual experience design. What product attributes are most important for customers when making a purchase decision? What features are most impactful to highlight in future visual designs?

**Technical Approach & Outcome:**
The team visited a Home Depot store to understand the business and data ecosystem. They dove into hundreds of thousands of reviews, product questions and online sales transactions data utilizing Google Cloud Platform big data tools and used TF-IDF (term frequency-inverse document frequency) to capture product feature importance based on what customers say. Using explanatory regression techniques, they quantified how prominence of certain features over time can have an impact on sales, and whether that impact is positive or not.

**Business Outcome:**
The students provided an automated and scalable approach to identify top product features that are most impactful on customer satisfaction and sales. The approach was applied to pilot categories and findings have received great feedback from merchants and teams. Significant long-term benefit is likely to be expected when the approach is adapted to fit in the visual design process for broader businesses.

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**EMORY HEALTHCARE: Mining Free-Form Notes in Electronic Medical Records to Detect Infection**

**Business Problem:**
Surgical procedures can result in infection and through manual efforts of professional abstractors, post-operative infections are detected. This manual approach is cost-prohibitive, so only 10% of the cases examined. Can infection detection be potentially automated from rich but unstructured free-form EMR notes?

**Technical Approach & Outcome:**
With the help of hospital staff, the student team mapped the data generation process. Employed bag-of-words for data preparation with refinements using TF-IDF, N-GRAM and Phrase Detection. Built an ensemble classifier from 6 different Machine Learning (ML) algorithms (XGboost, random forest, decision tree, logistic regression, support vector machine). The best ML approach (out-of-sample performance) produced an AUC=0.86 that met the requisite sensitivity and specificity standards.

**Business Outcome:**
The students automated an expensive manual process to improve processing time from weeks to days and importantly allowed for an examination of ALL (100%) surgical cases from a previous 10% sample. Significant long-term cost savings likely, with a potential for improved quality of care from dynamic monitoring of infection.

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“As a Capstone Sponsor, my team and I were able to work closely with the talented MSBA students in solving a complex business problem with data and analytical skills. The Capstone program is a great platform for us to collaborate with Emory MSBA and connect with other analytical leaders.”

*Iris Singhania, PhD, Director, Space Optimization, The Home Depot*
“The capstone project is an opportunity to have the broad base of talent in the MSBA program add valuable insights to real life business scenarios. Our relationship with Goizueta offers outside in perspectives that continue to validate a solid return on investment from this FedEx/Goizueta relationship.”

Donald Comer, Staff Vice President, Operations Analysis, FedEx

“The capstone experience really prepared me to handle real world, end-to-end analytics projects. The data mining and business communication methodologies I practiced during the capstone have enabled me to solve the right problems and deliver actionable results using my technical and analytical skills in my current job.”

Wen Zhang, 18MBSA, Data Analyst, Inventory Analytics, The Home Depot

FOR OPPORTUNITIES, CONTACT:
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