MaCuDE

Management Curriculum for the Digital Era

Analytics/OR/OM/Data Science Disciplinary Task Force (Analytics DTF) Phase I Report

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Contents

Analytics Disciplinary Task Force (DTF) Members and Affiliations

#	University	First Name	Last Name	Title
1	Baylor U	Cindy	Riemenschneider	Prof IS
2	Beijing Info Science & Tech U	Qiong	He	MBA Coordinator
3	Binus U, Business School	Rini	Setiowati	Dean
4	Bloomsburg U of PA	Kenneth	Hall	Associate Professor of Marketing
5	Florida International U	Richard	Klein	Associate Dean of Landon UG / MIS & Analytics
6	Georgia Tech	Ravi	Subramanian	Assoc Professor OM
7	Goa Institute of Management	Nitin	Upadhyay	Chair and Head Centre for Innovation; Information Technology and Big Data Analytics
8	HULT Intern, School of Business	Omar	Hernandez	Prof. Op Research & Mgmt Science
9	K.J. Somaiya Inst Mgmt + Res (SIMSR)	D.G.	Jha	Area Chair - IT, Chair: Ctr in Data Science
10	LM Thapar School of Management	Sandeep	Goyal	Professor
11	Montclair State U	Gregory	Cant	Dean, Feliciano School of Business
12	Montclair State U	Rashmi	Jain	Prof of IS & Analytics
13	Northwestern State U of Louisiana	Curtis	Penrod	Coordinator of CIS & Assistant Professor
14	Oulu U	Janne	Jarvinen	Associate Dean
15	Politecnico di Milano, SOM	Andrea	Sianesi	Dean
16	Rowan U	Jennifer	Nicholson	Associate Professor of MIS
17	Rowan U	Morris	Kalliny	Associate Dean and Prof of Marketing
18	Rutgers U	Farid	Alizadeh	Prof, Management Sc & IS
19	S P Jain Inst of Mgmt & Res	Debasis	Mallik	MBA Director
20	Sabanci U	Abdullah	Dasci	Assoc Prof OM
21	Southern U	Jose	Noguera	Chair and Professor

#	University	First Name	Last Name	Title
22	St Norbert College	Daniel	Heiser	Dean
23	Stevens Inst of Technology	Ted	Stohr	Professor of Information Systems & Analytics
24	SUNY Oswego	Sarah	Bonzo	Associate Professor, OM and Health Services
25	Thomas Jefferson U	Philip	Russell	Dean, School of Business
26	U of Arizona	Hsinchun	Chen	Endowed Chair Prof IS/Analytics
27	U of Bradford	Amir	Sharif	Assoc Dean, Prof of OM & Circular Economy
28	U of Dallas	Brett	Landry	Dean and Professor of Cybersecurity
29	U of Dallas	Sri	Beldona	Associate Dean - Academics
30	U of East Anglia	Raphael	Markellos	Director of Research
31	U of Hohenheim	Jens	Vogelgesang	Associate Dean
32	U of Illinois, Gies	Robert	Brunner	Ass. Dean for Innov, Chief Disruption Officer, Prof Acc
33	U of Kentucky	Simon	Sheather	Dean
34	U of St. Thomas - Houston	David	Schein	Assoc Dean of Grad Programs
35	U of Tubingen	Amrei	Nensel	Coordinator of International Affairs & PG Studies
36	U of Washington-Bothell	Surya	Pathak	Assoc. Prof. of OM
37	U of Washington-Foster	Debabrata	Dey	Endowed Chair Prof on IS- working on digital
38	U of Washington-Tacoma	Haluk	Demirkan	Endowed Prof, Dir Ctr Analytics, Dir MS Analytics
39	U of Wisconsin, Whitewater	Andrew	Ciganek	Chair - IT & Supply Chain
40	Universitas Gadhah Mada	Kusdhianto	Setiawan	Vice Dean for Asset & Prof of Economics
41	William and Mary	Joe	Wilck	Clinical Assoc Professor
42	SKEMA Business School	Thierry	Warin	Professor of Data Science

Timeline of Activities of the Analytics DTF since Kick-Off

- "Slack" as the primary means of collaborating
    - Emails as needed
- Draft survey released on April 5, 2020
    - Feedback solicited from Analytics Task Force members
    - Multiple iterations of improvement
- Final survey released to Task Force on April 22, 2020
    - Periodic updates on Slack to encourage and acknowledge respondents
- Shared with Institute for Operations Research and the Management Sciences (INFORMS) and Manufacturing & Service Operations Management (MSOM) Society mailing lists on May 11, 2020

Structure of this Report

- **This report is based on survey responses received as of July 31, 2020**
    - **30 responses related to offerings in Undergraduate programs**
    - **36 responses related to offerings in Graduate programs**
- Survey questions are included in Appendix A.
- Survey respondents are gratefully acknowledged in Appendix B.
- This report uses data visualizations (word clouds/charts) to summarize the main themes within the responses, differentiated on the basis of whether the responses pertain to Undergraduate or Graduate courses.
- A spreadsheet containing the raw responses will be made available to the MaCuDE Project Leadership.

I. Countries Represented among the Responses

The majority of the responses in both the Undergraduate and Graduate Program categories were from the United States. Responses in the Graduate Program category were more globally representative.

Undergraduate

Graduate

II. Course Titles

The course titles tend to use Analytics key words/phrases (e.g., Analytics, Data, Intelligence, Optimization). Some courses have a functional label (e.g., Operations, Marketing) and are designed to focus on Analytics methods as they pertain to a specific discipline. Some courses are offered by the same instructor across Undergraduate and Graduate programs and, thus, the same course title may be used across programs.

Undergraduate

Graduate

III. Instructor Titles

Both tenure-track and non-tenure-track faculty were represented among the respondents. Among tenure-track faculty, early career faculty had greater representation. Under the assumption that response rates are not a function of title, it appears that Analytics courses tend to be taught or favored by early career faculty. This may be a function of the evolution of training and research foci in PhD programs to reflect the growing importance and relevance of Analytics methods to various business contexts.

Undergraduate

Graduate

IV. Programs in which Courses are Offered

At the Undergraduate level, the courses are offered in Degree (BBA) and Certificate programs. In Undergraduate Degree programs, the courses count towards a Major or a Minor. At the Graduate level, the courses are offered in MBA, Master of Science, and Certificate programs. Overall, courses in Analytics appear to be an essential component across various program offerings at the Undergraduate and Graduate levels.

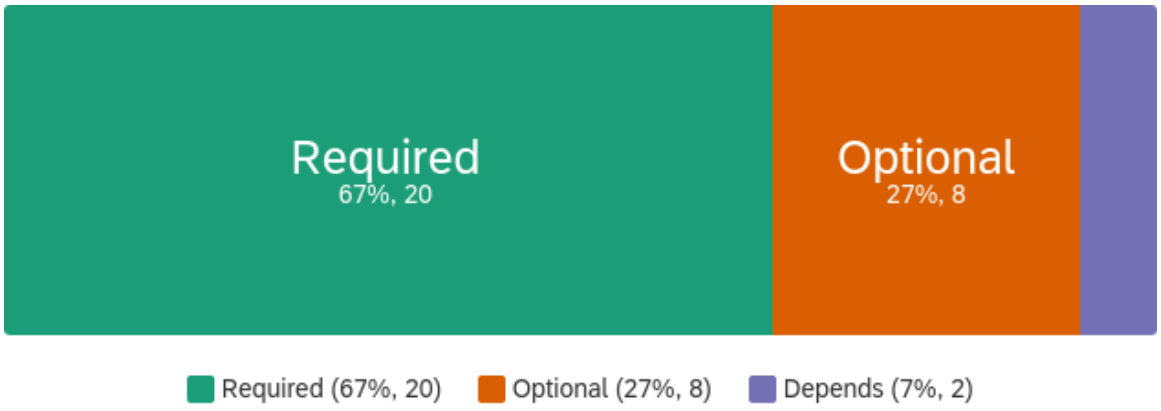
Undergraduate

Graduate

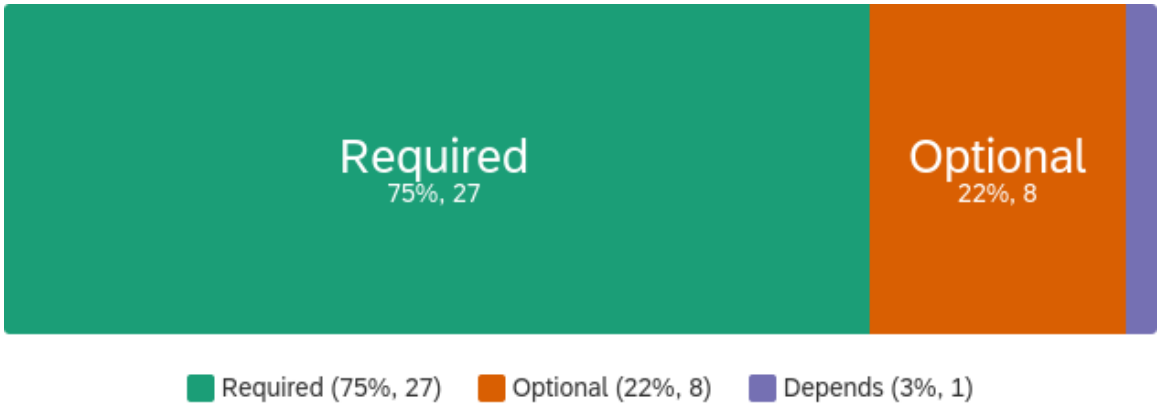
V. Whether Courses are Required or Optional

Not only are Analytics courses an essential component of Undergraduate and Graduate programs, but the majority of the courses are required in the programs in which they are offered. This holds to a greater extent in Graduate programs. Nonetheless, there is an opportunity to further expand the inclusion of Analytics courses among core/required courses in both Undergraduate and Graduate programs.

Undergraduate



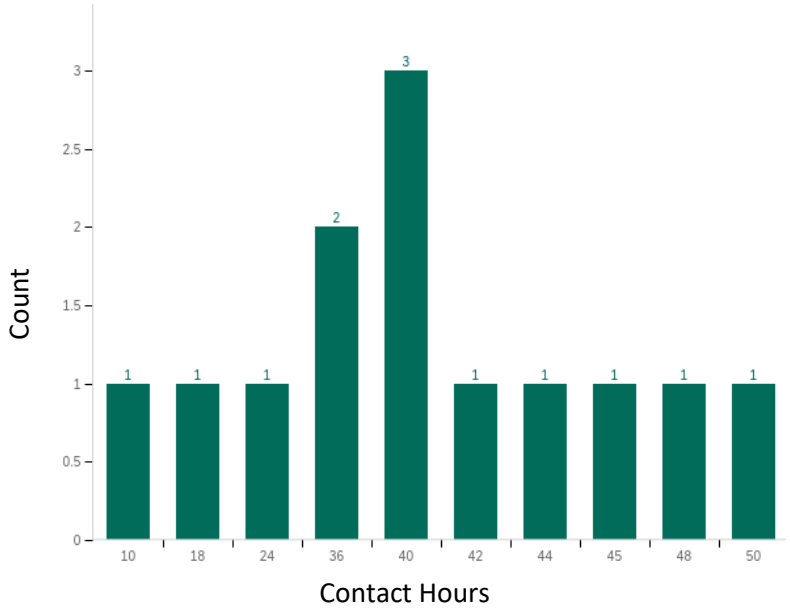
Graduate



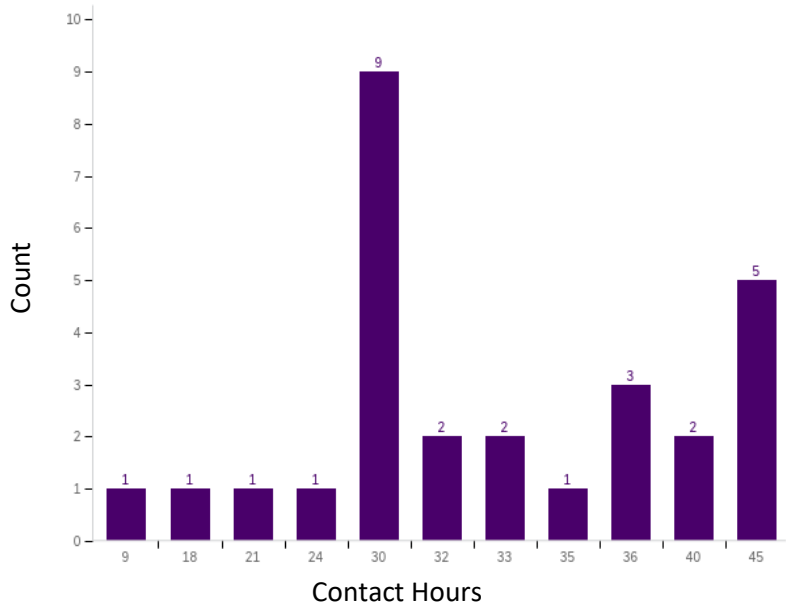
VI. Contact Hours

On a related note, the Analytics courses offered are not just abbreviated courses or modules, but are typically extensive in terms of the number of hours of instruction. Note that, in the graphs below, responses that indicated the number of *credit* hours (e.g., 1.5 and 3 hours) instead of *contact* hours asked in the question, were excluded.

Undergraduate



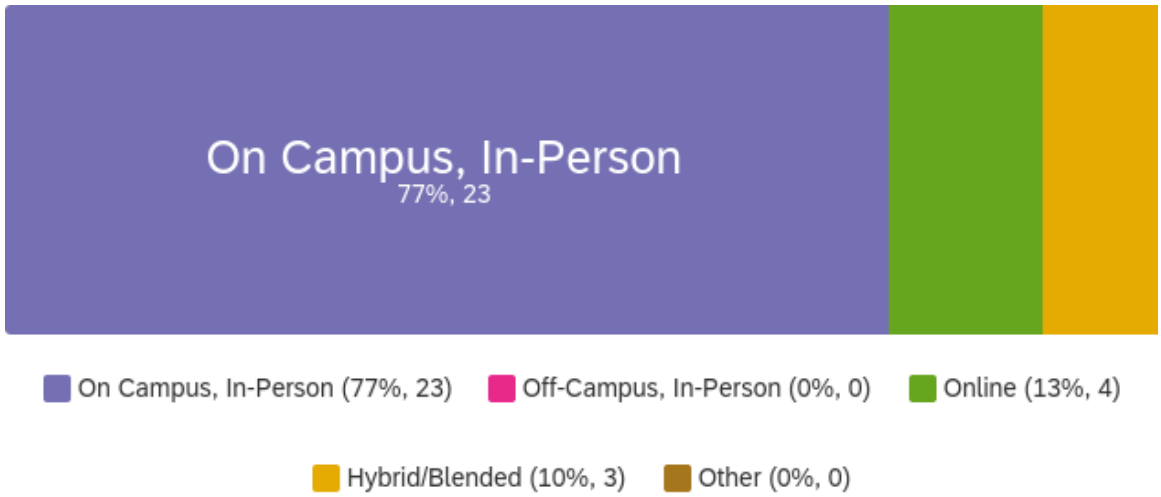
Graduate



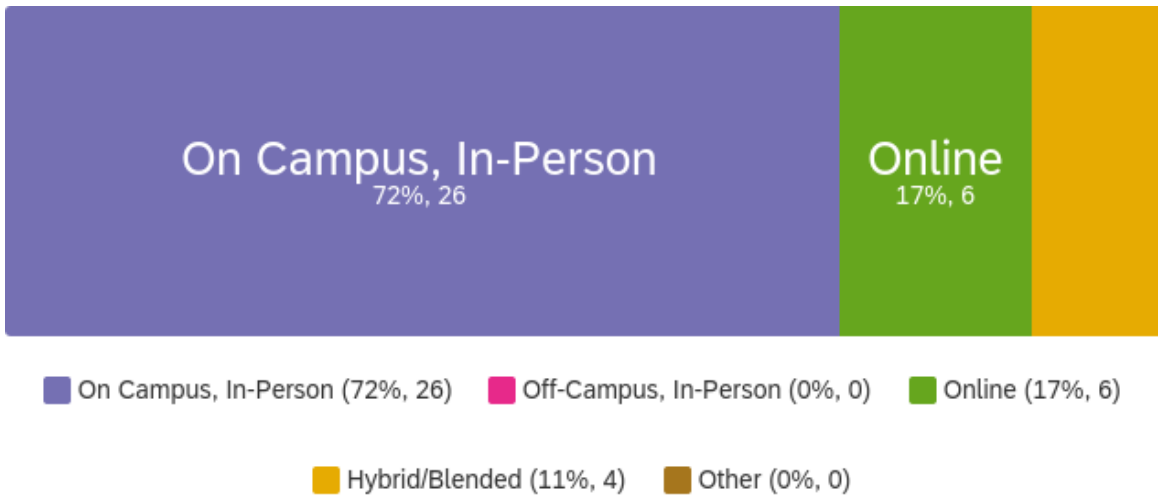
VII. Delivery Mode (Pre-COVID)

The majority of the courses – across both Undergraduate and Graduate programs – are offered in person, with a smaller proportion offered Online or in a Hybrid/Blended format. The usage of the online/hybrid/blended formats is slightly higher in Graduate programs.

Undergraduate



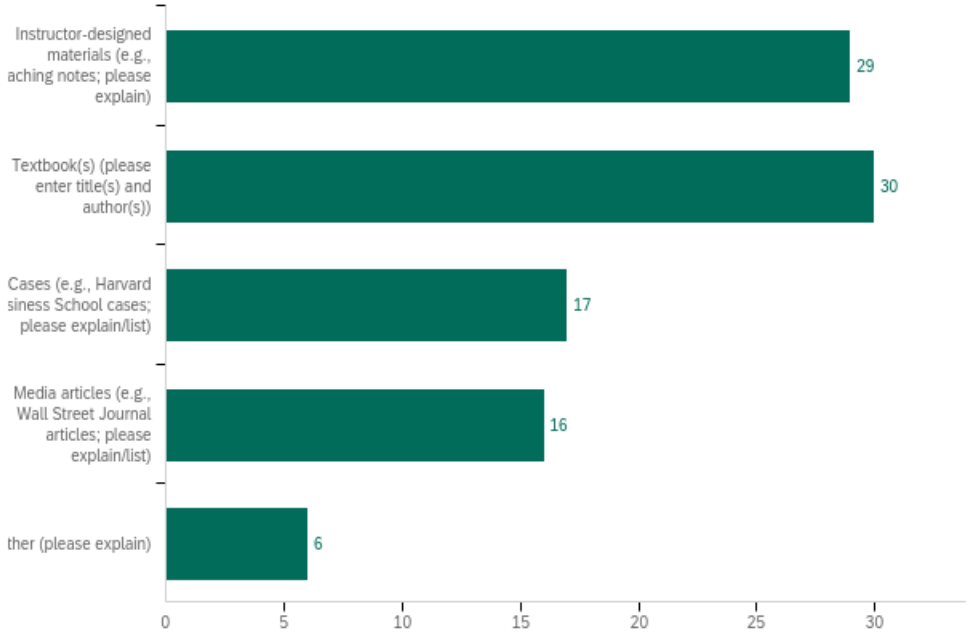
Graduate



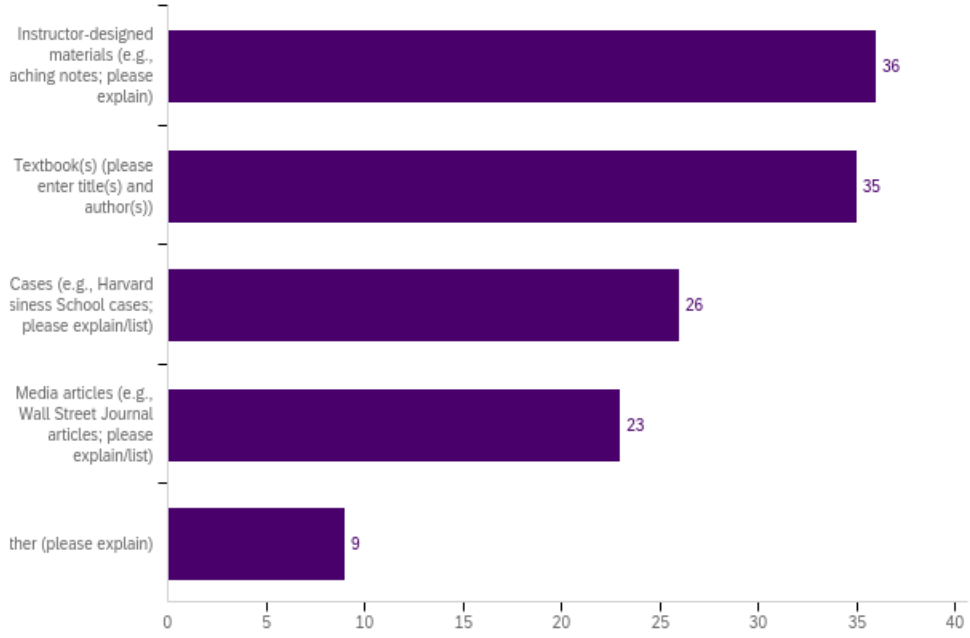
VIII. Course Materials Used

Courses offered in both Undergraduate and Graduate programs predominantly use instructor-designed materials (e.g., teaching notes) and textbooks. Cases and media articles are used to a greater extent in Graduate programs as compared to Undergraduate programs. There may be an opportunity to develop more business cases (more in number or more relevant to the content/context) for use in Analytics courses.

Undergraduate



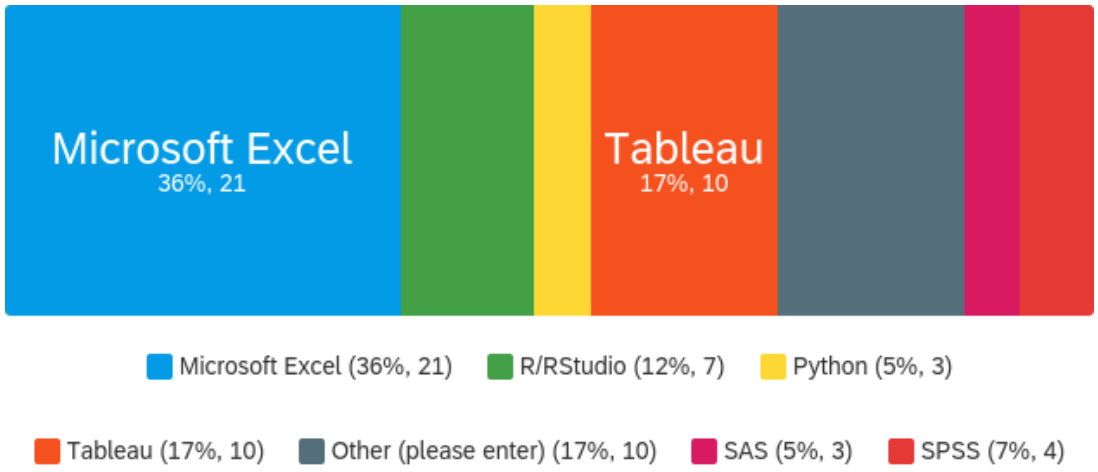
Graduate



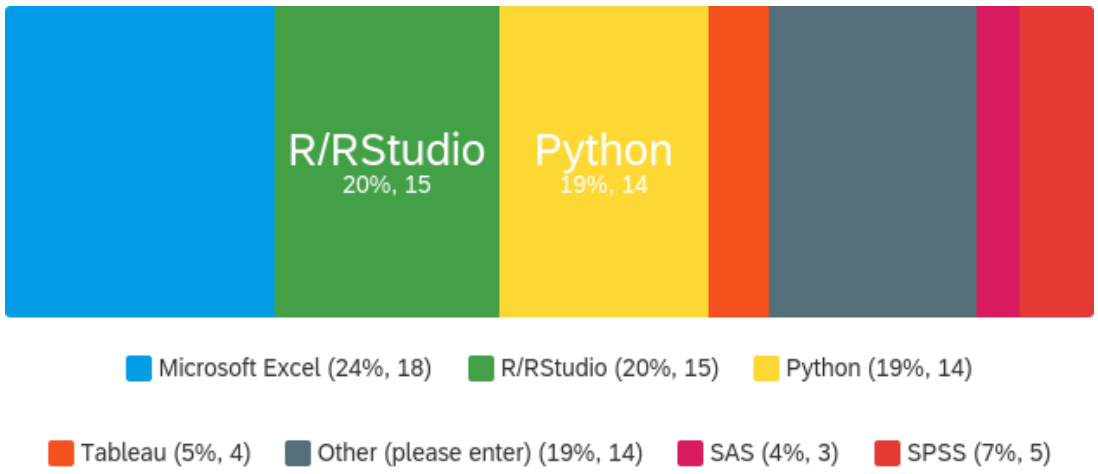
IX. Software Programs Used

Across both Undergraduate and Graduate courses, Excel is the most popular Software Program that is used. Graduate courses tend to use R/Studio and Python to a greater extent than Undergraduate courses. To the extent that the adoption of R/Studio and Python are constrained by the challenge of combining the teaching of programming/coding along with covering other course content, there may be an opportunity to include an introductory course or boot camp on programming for all students.

Undergraduate



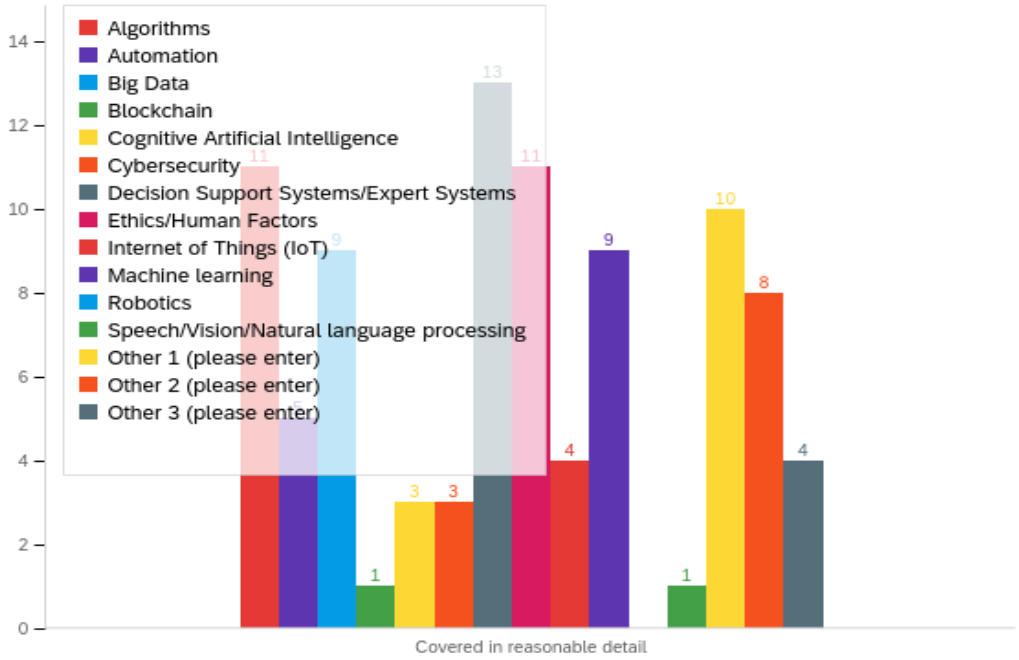
Graduate



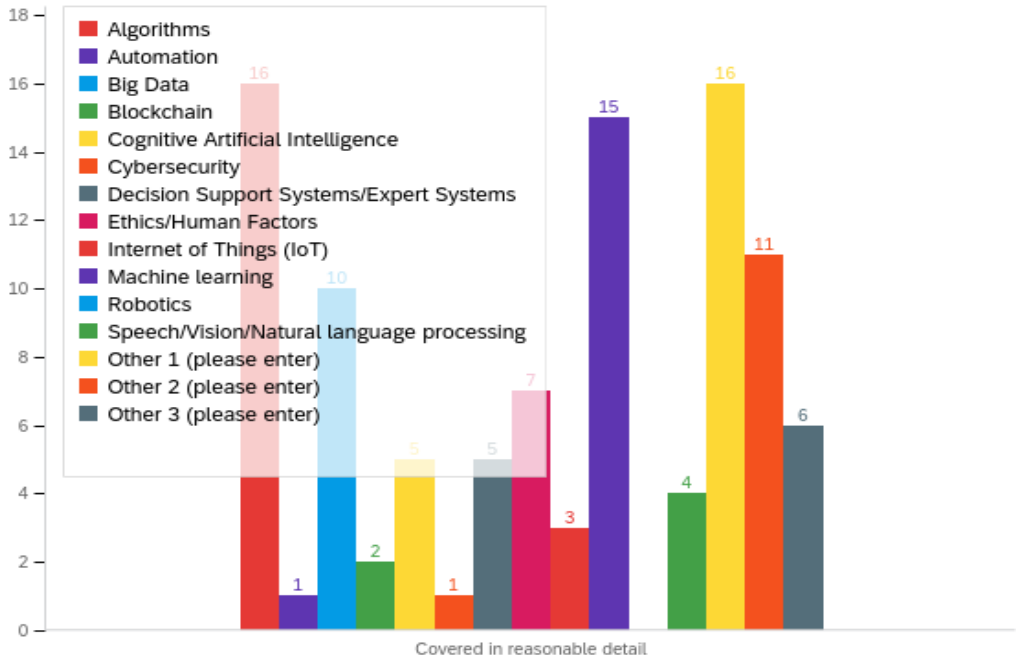
X. Topics Covered

An interesting point of note is the difference in topic coverage across Undergraduate and Graduate courses. The breadth and depth of coverage of different topics will be among the points of emphasis in Phase II. Conversations with industry representatives in Phase II will help inform how topic coverage should be shaped, given current and future business considerations.

Undergraduate



Graduate



XI. Discussion of Sustainability and Ethics

An encouraging observation among the responses was the consideration of topics related to sustainability and ethics. Related topics discussed within courses include ethical issues in analytics (e.g., data privacy and transparency of analytics models and algorithms), and the relationship between analytics and corporate social responsibility (economic, social, and environmental).

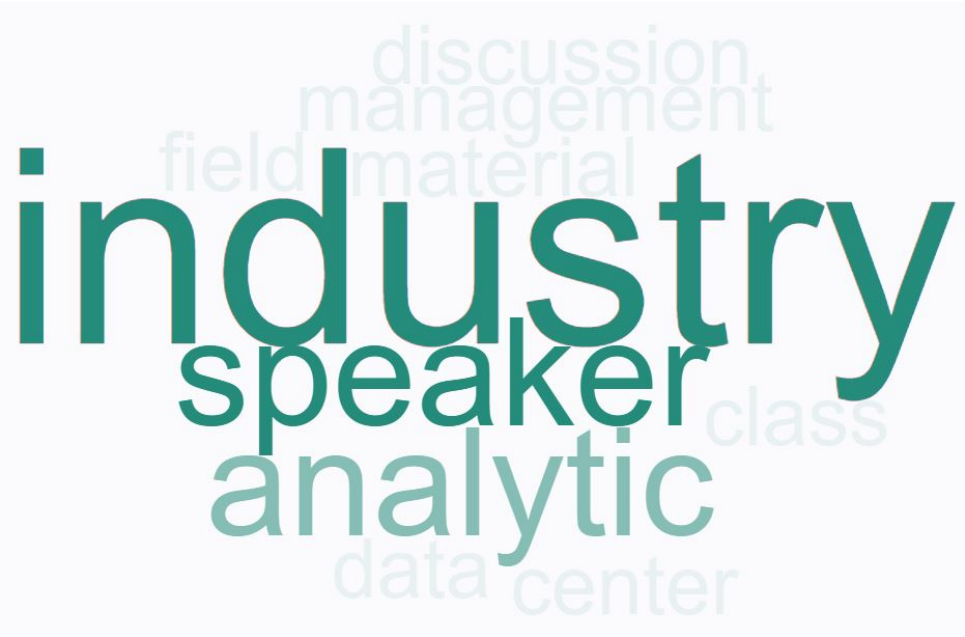
Undergraduate

Graduate

XII. Industry Involvement

Another encouraging observation is practitioner/company involvement within courses. Whereas the involvement in Undergraduate courses tends to be more in the form of speaking, leading a discussion, or sharing data, the involvement in Graduate courses is deeper and may take the form of a course project related to the company or industry. Looking ahead, Phase II of the MaCuDE Project should help identify additional opportunities/mechanisms for industry engagement.

Undergraduate



Graduate

Appendix A: Analytics DTF Survey

MaCuDE - Analytics Task Force Survey

Start of Block: Default Question Block

Q1
Management Curriculum for the Digital Era (MaCuDE) is an AACSB International-sponsored initiative that is uniting leaders in academia and industry to understand the challenges and opportunities presented by the Digital Era. The aim is to shape academic offerings to ensure that students graduate with the mindset, knowledge, and skills required to lead in areas that have disruptive potential. The initiative is financially supported by PricewaterhouseCoopers. More information is available at http://macude.org/.

This survey is being administered by the MaCuDE Disciplinary Task Force for **Analytics/OR/OM/Data Science**. In this phase of the initiative, we are interested in understanding curricular offerings in Analytics/Data Science tools and methods, and Operations/Supply Chain applications of analytics.

We request that this survey be directly filled by the faculty member teaching a related course or course module. For ease of response, this survey is designed **at the course/module level**, even if taught across different programs. If you teach different courses/modules, we kindly request that you fill the survey separately for each one.

If you have any questions, please send an email to **macude@stevens.edu** with "Analytics DTF" in the subject line.

By taking *less than 15 minutes* to respond to this survey, you will play an important role in shaping the future of business education.

Thank you for contributing to this collective effort!

- MaCuDE Analytics Disciplinary Task Force

Page Break

Appendix A: Analytics DTF Survey

Q2 *Required fields are indicated with asterisks (*).*

Q3 Please enter your name.

- First Name* _____
- Middle Name/Initials _____
- Last Name* _____

Q4 Please enter your affiliation.

- Title/Rank (e.g., Assistant Professor)*
  _____
- Department/Area _____
- College/School/University* _____
- City _____
- Country* _____

Q5 Please enter your email address.*

_____

Page Break

Appendix A: Analytics DTF Survey

Q6 *Required fields are indicated with asterisks (*).*

Q7 Please enter the title for your course/course module.*

_____

Q8 Please upload your course syllabus/module description by clicking on the box below. If your offer the ***same*** course/module across different programs, you may consolidate all syllabi/descriptions in one file.*

Although a full syllabus/module description will be ideal, we understand that you may be able to share only certain portions. *(To change your uploaded file, please click on the lighter gray area in the box below.)*

Q9 Please enter information about the program(s) in which you offer this course/module.*

Program name	Is your course/module required or optional?	Program level	Number of contact hours for your course/module	Comments

Page Break

Appendix A: Analytics DTF Survey

Q10 *Required fields are indicated with asterisks (*).*

Q11 Please select the types of materials you use in your course/module. Your explanations will be valuable to the Task Force.*

- ☐ Instructor-designed materials (e.g., teaching notes; please explain) _____
- ☐ Textbook(s) (please enter title(s) and author(s)) _____
- ☐ Cases (e.g., Harvard Business School cases; please explain/list) _____
- ☐ Media articles (e.g., Wall Street Journal articles; please explain/list) _____
- ☐ Other (please explain) _____

Page Break

Appendix A: Analytics DTF Survey

Q12 *Required fields are indicated with asterisks (*).*

Appendix A: Analytics DTF Survey

Q13 Please indicate the extent to which your course/module covers the following topics.*

	Not covered	Briefly discussed	Covered in reasonable detail
Algorithms	○	○	○
Automation	○	○	○
Big Data	○	○	○
Blockchain	○	○	○
Cognitive Artificial Intelligence	○	○	○
Cybersecurity	○	○	○
Decision Support Systems/Expert Systems	○	○	○
Ethics/Human Factors	○	○	○
Internet of Things (IoT)	○	○	○
Machine learning	○	○	○
Robotics	○	○	○
Speech/Vision/Natural language processing	○	○	○
Other 1 (please enter)	○	○	○
Other 2 (please enter)	○	○	○
Other 3 (please enter)	○	○	○

Appendix A: Analytics DTF Survey

Q14 Please select the software tools used in the course/module.*

- ☐ Microsoft Excel
- ☐ Python
- ☐ R/RStudio
- ☐ SAS
- ☐ SPSS
- ☐ Stata
- ☐ Tableau
- ☐ Other (please enter) _____

Page Break

Appendix A: Analytics DTF Survey

Q15 If your course/module involves industry participation (e.g., industry speakers, company-sponsored case studies or projects), please include brief details below.
(e.g., company names, discussion topics, project topics)

_____

_____

_____

_____

Q16 If your course/module discusses issues related to Ethics, Sustainability, or Corporate Governance, please include brief details below.

_____

_____

_____

_____

Q17
Please use the space below to enter any comments that may be helpful to the MaCuDE Analytics Disciplinary Task Force.

For example you may reflect on:
What topics in your course/module do you believe are the most important from the standpoint of participants' jobs/careers and why?
What emerging topics do you believe are important for schools to include within their curricula related to Analytics/Data Science methods or Operations/Supply Chain Analytics and why?

_____

_____

_____

_____

End of Block: Default Question Block

Appendix B: Survey Respondents

Survey Respondents

*[*In order of response. Repeated names indicate responses for more than one course/module]*

First Name	Last Name	Affiliation
Ravi	Subramanian	Scheller College of Business, Georgia Tech
Ronda	Mariani	Bloomsburg University of Pennsylvania
Joseph	Wilck	William & Mary
Abdullah	Dasci	Sabanci University
Christian	Grandzol	Bloomsburg University of Pennsylvania
Thierry	Warin	SKEMA Business School
Thierry	Warin	SKEMA Business School
Sarah	Bonzo	State University of New York at Oswego
Robert	Myers	Scheller College of Business, Georgia Tech
Koushyar	Rajavi	Georgia Tech
June	Dong	SUNY Oswego
Chitu	Okoli	SKEMA Business School
Matthew	Douglas	Baylor University
Vinod	Singhal	Scheller College of Business, Georgia Tech
Tatiana	Rudchenko	Scheller College of Business, Georgia Tech
Qiuping	Yu	Scheller College of Business, Georgia Tech
David	Schein	Cameron School of Business of University of St. Thomas
Andrea	Sianesi	Politecnico di Milano
Amit	Bhardwaj	Thapar Institute of Engineering & Technology
Jooh	Lee	Rowan University
Omar	Romero-Hernandez	Hult International Business School
Nitin	Shelke	Thapar Institute of Engineering & Technology
Craig	Johnson	University of Bradford
Kenneth	Hall	Bloomsburg University of Pennsylvania
Behrooz	Davazdahemami	University of Wisconsin-Whitewater
Behrooz	Davazdahemami	University of Wisconsin-Whitewater
Amin	Vahedian	University of Wisconsin-Whitewater
Nicole	Wishart	Florida International University
David	Agogo	College of Business, Florida International University
Nicole	Wishart	Florida International University
Edward	Duran	Florida International University

Appendix B: Survey Respondents

First Name	Last Name	Affiliation
Shih-Hui	Hsiao	Rowan University
Mohit		Thapar Institute of Engineering & Technology
Sandeep	Goyal	Thapar Institute of Engineering and Technology
Sandeep	Goyal	Thapar Institute of Engineering and Technology
Piyush	Kumar	Thapar Institute of Engineering and Technology
Sreekumar	Pillai	Thapar Institute of Engineering and Technology
James	Roh	Rowan University
Whitney	Conner	University of Kentucky
Cristina	Scherrer	University of East Anglia
Zahid	Hussain	University of Bradford
Rashmi	Jain	Montclair State University
Nitin	Upadhyay	Goa Institute of Management
Bruce	Hartman	University of St. Francis
Jim	Hoover	University of Florida
James	Brooks	Virginia Commonwealth University
Susan	Williams	Northern Arizona University
Susan	Williams	Northern Arizona University
James	Minas	Ithaca College
Levent	Bulut	Valdosta State University
Sandun	Perera	University of Nevada, Reno
Fred	Riggins	College of Business, North Dakota State University
Fred	Riggins	College of Business, North Dakota State University
Sam	Kirshner	University of New South Wales
Jason	Powell	Northwestern State University
Owen	Wu	Kelley School of Business, Indiana University
Weiwen	Liao	Northwestern State University
Venkataraghavan	Krishnaswamy	Indian Institute of Management Kashipur
Raydel	Tullous	University of Texas at San Antonio
Edward (Ted)	Stohr	Stevens Institute of Technology
Sasa	Zorc	Darden School of Business, University of Virginia
Ali	Adeli	University of Memphis
Feng	Cheng	Minnesota State University