Business Analytics (career), M.S.

Businesses of all sizes are creating and storing more data than ever before according to IBM—2.5 quintillion bytes per day. Businesses are swimming in data, but often lack the talent and expertise to use it effectively for making decisions, revealing insights, and making predictions. Business analytics experts are changing that. The full-time Master of Science program in business analytics puts students on the leading edge of a burgeoning industry hungry for top notch talent.

Students learn the skills and techniques necessary to turn raw data into actionable insights. Descriptive and diagnostic analytics are just starting points in the program. The skills learned develop students into decision-makers and data scientists adept at using predictive and prescriptive analytics to solve business problems.

The full-time program is located in Iowa City. The plan of study spans 16 months, and includes core courses, internships, and electives.

Requirements

The full-time Master of Science program in business analytics requires a minimum of 40 s.h. of graduate credit. Transfer credit may be accepted with approval from the program. A major g.p.a. and a cumulative g.p.a. of at least 2.75 is required in all coursework.

The M.S. with a major in business analytics requires the following coursework.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Experience Course/Project</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>40</strong></td>
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Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BAIS:6050</td>
<td>Data Management and Visual Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6070</td>
<td>Data Science</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9100</td>
<td>Data and Decisions</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9110</td>
<td>Advanced Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9400</td>
<td>Professional Development and Business Acumen (taken fall and spring semester for 1 s.h. each)</td>
<td>2</td>
</tr>
<tr>
<td>MBA:8130</td>
<td>Business Communication (taken fall and spring semester for 1 s.h. each)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>All of these:</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

Elective coursework allows students to deepen or broaden their skills. Additional electives may be available for credit but must be preapproved.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>BAIS:4280</td>
<td>Cybersecurity</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6040</td>
<td>Data Programming in Python (if not taken as core course)</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6060</td>
<td>Data Programming in R (if not taken as core course)</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6100</td>
<td>Text Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6105</td>
<td>Social Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6110</td>
<td>Big Data Management and Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6130</td>
<td>Applied Optimization</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6140</td>
<td>Information Visualization</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6150</td>
<td>Financial Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6170</td>
<td>Directed Readings - Graduate Business Analytics</td>
<td>arr.</td>
</tr>
<tr>
<td>BAIS:6180</td>
<td>Healthcare Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6190</td>
<td>Forecasting</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6210</td>
<td>Data Leadership and Management</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6220</td>
<td>Business Analytics Certification Workshop</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6280</td>
<td>Cybersecurity</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9210</td>
<td>Introduction to Modeling with VBA</td>
<td>3</td>
</tr>
<tr>
<td>ACCT:9170</td>
<td>Advanced Accounting Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BIOS:5120/IGPI:5120/STAT:5610</td>
<td>Regression Modeling and ANOVA in the Health Sciences</td>
<td>3</td>
</tr>
<tr>
<td>BIOS:5310/IGPI:5310/STAT:5810</td>
<td>Research Data Management</td>
<td>3</td>
</tr>
<tr>
<td>CS:3210</td>
<td>Programming Languages and Tools</td>
<td>arr.</td>
</tr>
<tr>
<td>CS:4420</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>CS:4470</td>
<td>Health Data Analytics</td>
<td>3</td>
</tr>
<tr>
<td>CS:5110/IGPI:5110</td>
<td>Introduction to Informatics</td>
<td>3</td>
</tr>
<tr>
<td>CS:5430</td>
<td>Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>ECE:5450/IGPI:5450</td>
<td>Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>ECE:5490</td>
<td>Multi-Dimensional Image Analysis Tools and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>ECON:4800</td>
<td>Econometric Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ECON:5800</td>
<td>Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>ECON:5805</td>
<td>Statistics for Economics</td>
<td>3</td>
</tr>
<tr>
<td>EPID:5200/IGPI:5220</td>
<td>Principles of Public Health Informatics</td>
<td>3</td>
</tr>
<tr>
<td>FIN:9160</td>
<td>Quantitative Finance and Deep Learning</td>
<td>0,3</td>
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</table>

Experience Course/Project

The experience course consists of a group project that solves a semester-long business problem.
GEOG:3520/IGPI:3520 GIS for Environmental Studies 3
GEOG:3540/IGPI:3540 Geographic Visualization 3
GEOG:4580/IGPI:4581 Introduction to Geographic Databases 3
GEOG:5540/IGPI:5540 Geographic Visualization 3
GEOG:5055/IGPI:5055 Geospatial Programming 3
ISE:3600/CEE:3142/STAT:3620 Quality Control 3
ISE:4172 Big Data Analytics 3
ISE:6380 Deep Learning 3
ISE:6760 Pattern Recognition for Financial Data 3
ISE:6780 Financial Engineering and Optimization 3
JMC:3640 Information and Data Visualization 3-4
MATH:4250 Introduction to Financial Mathematics 3
ME:4111/CEE:4511 Scientific Computing and Machine Learning 3
ME:4150 Artificial Intelligence in Engineering 3
MKTG:9165 Digital Marketing Analytics 3
MKTG:9310 Marketing Analytics 3
POLI:3001 Hawkeye Poll 3
PSQF:6209/STAT:6513 Survey Research and Design 3
PSQF:6243/STAT:6513 Intermediate Statistical Methods 3
PSQF:6246/STAT:6516 Design of Experiments 4
PSQF:6250 Computer Packages for Statistical Analysis (not recommended if completed BAIS:6060) 1-3
STAT:4100/IGPI:4100 Mathematical Statistics I 3
STAT:4101/IGPI:4101 Mathematical Statistics II 3
STAT:4200/IGPI:4200 Statistical Methods and Computing 3
STAT:4540/IGPI:4540 Statistical Learning 3
STAT:4560 Statistics for Risk Modeling 3
STAT:5100 Statistical Inference I 3
STAT:5200/IGPI:5199 Applied Statistics I 4
STAT:5400/IGPI:5400 Computing in Statistics 3
STAT:6560 Applied Time Series Analysis 3
STAT:7400/IGPI:7400 Computer Intensive Statistics 3
URP:6200/URP:6225/STAT:6516 Applied GIS for Planning and Policy Making 1,3

May include 6 s.h. from these:
ENTR:9800 Entrepreneurship: Advanced Business Planning 1-3
MBA:8140 Corporate Financial Reporting 3
MBA:8170 International Economic Environment of the Firm 3
MBA:8180 Managerial Finance 3
MGMT:3200 Individuals, Teams, and Organizations 3
MGMT:4325 Team and Project Management 3

Combined Programs

M.S./J.D.
The combined Master of Science in business analytics (career subprogram)/Juris Doctor allows students to pursue two degrees simultaneously, earning both more quickly than they would if the degrees were pursued separately. The Department of Business Analytics collaborates with the College of Law to offer the combined program.

Separate application to each degree program is required. Applicants must be admitted to both programs before they may be admitted to the combined program. For more information, see the Juris Doctor, J.D. (College of Law) in the Catalog.

M.S./M.S. in Finance
The combined Master of Science in business analytics (career subprogram)/Master of Science in finance allows students to pursue two degrees simultaneously, earning both more quickly than they would if the degrees were pursued separately. The Department of Business Analytics collaborates with the Department of Finance to offer the combined program.

A single admission application is available for the combined degree program. For more information, see the M.S. in finance in the Catalog.
Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Applicants must:

- have earned a bachelor's degree from a U.S. college or university, or have earned an equivalent degree from another country;
- submit unofficial transcripts with their application and official transcripts for admission;
- have earned a minimum g.p.a. of at least 3.00 or the international equivalent;
- submit a current résumé that includes information about employment (if applicable), education, extracurricular activities, and community involvement;
- submit a statement of purpose with a maximum length of 500 words; and
- submit two recommendations that must be received within two weeks of the submission deadline.

Applicants whose first language is not English must submit official test scores to verify English proficiency. They can verify English proficiency by submitting official test scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). Applicants who use the IELTS test are required to take the on-campus English Proficiency Examination.

Application deadlines are as follows.

- Priority deadline: December 15
- International student deadline: March 15
- Domestic student deadline: June 15

Academic Plans

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Career</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 s.h. of graduate level coursework must be completed; up to 6 s.h. of graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website.</td>
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Maintain at least a 2.75 cumulative and program GPA.

<table>
<thead>
<tr>
<th>Hours</th>
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First Year

Any Semester

Meet with your Career Management coach and Professional Director.

Attend Career Management Center sessions offered.

Apply to and secure a summer internship or arrange a summer research project.

Fall

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAIS:6050</td>
<td>Data Management and Visual Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:6040 or BAIS:6060</td>
<td>Data Programming in R or Data Programming in Python</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9100</td>
<td>Data and Decisions</td>
<td>3</td>
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<tr>
<td>BAIS:9400</td>
<td>Professional Development and Business Acumen</td>
<td>1</td>
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Elective course

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>3</td>
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Arrange for the Career Management Center to review updated resume, then upload to Handshake.

Spring

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BAIS:6070</td>
<td>Data Science</td>
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<tr>
<td>BAIS:9110</td>
<td>Advanced Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAIS:9400</td>
<td>Professional Development and Business Acumen</td>
<td>1</td>
</tr>
<tr>
<td>MBA:8130</td>
<td>Business Communication d</td>
<td>1</td>
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Elective course

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>3</td>
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</table>

Elective course

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>3</td>
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</table>

Complete end of semester employment placement survey as requested by Career Management.

Summer

Internship: complete a summer internship

Research: complete a summer research project

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>13</td>
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</table>

Second Year

Any Semester

Meet with your Career Management coach and Professional Director.

Attend Career Management Center sessions offered.

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
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Fall

<table>
<thead>
<tr>
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<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BAIS:6120</td>
<td>Analytics Experience</td>
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</tr>
<tr>
<td>MBA:8130</td>
<td>Business Communication d</td>
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</table>

Elective course

<table>
<thead>
<tr>
<th>Hours</th>
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</tbody>
</table>

Elective course

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

Complete end of semester employment placement survey as requested by Career Management.

Verify completion of all degree requirements with program administrator.

Apply to and secure post-graduation employment.

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>13</td>
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Total Hours

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
</tr>
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