**Master of Science Program**
Program Code: MS-GR  
Major Code: MUL  
HEGIS 4999

Dr. Kevin J. Miller, Dean  
Dr. Kimberly J. Jackson (jacksokj@buffalostate.edu), Program Coordinator and Assistant Dean for Strategic and Enrollment Planning  
The Graduate School (http://graduateschool.buffalostate.edu)  
Cleveland Hall 204, (716) 878-5601

**Interdisciplinary Unit in Data Science and Analytics**  
Dr. Joaquin Carbonara (carbonjo@buffalostate.edu), Principal Adviser (Math/Statistics)  
Mathematics Department  
Science and Math Complex 384, (716) 587-2882

Dr. Barbara Sherman (shermaba@buffalostate.edu), Principal Adviser (Computer Information Systems)  
Computer Information Systems  
Technology Building 206, (716) 878-4925

The Multidisciplinary Studies Data Science and Analytics Track is designed for individuals with quantitative talent, scientific background, and an entrepreneurial mindset wanting to join the data revolution that is changing all aspects of modern life. Data science and analytics (DSA) is a fast-growing discipline leading to excellent job opportunities in a variety of fields, including business, industry, health, government, and education.

Through advisement and within certain guidelines, students who enroll in the DSA track will be guided to create their best degree curriculum based on their own career aspirations. The curriculum includes courses covering big data, statistics, machine learning, database management, data visualization, programming, and business intelligence. All students will have applied- and experiential-learning opportunities, be involved in research, and be required to complete an internship.

Students in the DSA track engage immediately in advanced courses in math and computer science. Because certain background knowledge is necessary for success, it is recommended applicants should have completed introductory level undergraduate or equivalent coursework in computer programming, mathematics, and basic statistics. If needed, the preparatory courses are available by advisement.

Upon satisfactory completion of an approved course of study, a Master of Science (M.S.) degree is awarded.

Other available master of science tracks include Individualized (http://ecatalog.buffalostate.edu/graduate/graduate-programs/multidisciplinary-studies-ms) and Nutrition (http://ecatalog.buffalostate.edu/graduate/graduate-programs/nutrition-multidisciplinary-studies-ms).

**Advisement**
After completing the statement of intent, the student will plan a meeting with Dr. Joaquin Carbonara or Dr. Barbara Sherman who will review the statement of intent, approve a plan of study, and agree to serve as project adviser. A detailed plan of study, including specific courses, is required.

When a principal adviser has been secured, the Principal Adviser Consent Form (http://graduateschool.buffalostate.edu/supplemental-application-materials) must be completed.

The principal adviser also enumerates any additional requirements the student must complete before being permitted to advance to candidacy, including but not limited to requiring that the student identify a second adviser (if needed) to support the course of study and read the eventual project.

The principal adviser is charged with working closely with the student throughout the plan of the study and with service as a point of contact with the Graduate School to support and advise the student. It is the student's responsibility to initiate and maintain contact and ongoing communication with the principal adviser.

1. A bachelor’s degree from an accredited college or university with a minimum cumulative GPA of 2.5 (4.0 scale).
2. A two- to three-page statement of intent (essay) that includes the following the educational and professional objectives and reasons for interest in a nontraditional study format.
3. Signed principal adviser consent form (http://graduateschool.buffalostate.edu/supplemental-application-materials). Students in the DSA track will be advised by Dr. Joaquin Carbonara or Dr. Barbara Sherman.
4. An interview with the program coordinator who will contact the student for an appointment after the completed application is received.
In addition, all applicants must review the Admission to a Graduate Program (http://ecatalog.buffalostate.edu/graduate/admission-graduate-program) section in this catalog.

1. Completion of a minimum of 30 credit hours, comprising at least 15 hours of 600- and 700-level courses, including the master’s project.
2. A maximum of 15 credit hours may be taken in a discipline that offers a master’s degree when the student does a master’s project (3 credits).
3. A maximum of 18 credit hours may be taken in a discipline that does not offer a master’s degree.
4. A maximum of 15 credit hours may be taken at another accredited institution. This coursework must conform to the limitations stated in 2 and 3 (above), meet the requirements of the Transfer Credit policy (http://ecatalog.buffalostate.edu/graduate/academic-requirements/transfer-credit), and have the prior approval of the principal adviser.
5. Only grades of B or better will be accepted as transfer credit. An official transcript showing transfer credit must be submitted to the Graduate School.
6. Coursework (including transfer credit) must be completed within the six-year period immediately preceding the date of completion of the program.
7. A maximum of 6 credit hours of independent study may be included in the program.
8. Students must maintain a minimum cumulative GPA of 3.0 (4.0 scale).
9. Master of Science candidates must complete a) a research methods course and b) a supervised project approved by the principal adviser. Individual principal advisers may impose further requirements on candidates based on practices and policies of their home department (second reader or oral defense, for example). These must be specified in writing at the outset of the degree program on the completed Principal Adviser Consent Form (http://graduateschool.buffalostate.edu/supplemental-application-materials).
10. A Degree Candidacy Application Form (http://graduateschool.buffalostate.edu/candidacy-forms), approved by the student’s principal, secondary (if required), and tertiary (if required) must be submitted to the Graduate School before the completion of 12 credit hours at Buffalo State.

### Electives (12 credit hours)
Select 12 credit hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>DSA 501</td>
<td>DATA ORIENTED COMPUTING AND ANALYTICS</td>
<td>3</td>
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<tr>
<td>DSA 650</td>
<td>DATA STRATEGY AND GOVERNANCE</td>
<td>3</td>
</tr>
<tr>
<td>BUS 519</td>
<td>COMMUNICATION FOR LEADERS AND MANAGERS</td>
<td>3</td>
</tr>
<tr>
<td>GEG 584</td>
<td>GEOSPATIAL PROGRAMMING</td>
<td>3</td>
</tr>
<tr>
<td>PSM 601</td>
<td>PROJECT MANAGEMENT FOR MATH AND SCIENCE PROFESSIONALS</td>
<td>3</td>
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</tbody>
</table>

Other courses available with advisement

### Research Methods and Internship (6 credit hours)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>SPF 689</td>
<td>METHODS AND TECHNIQUES OF EDUCATIONAL RESEARCH</td>
<td>3</td>
</tr>
<tr>
<td>DSA 690</td>
<td>MASTER'S PROJECT</td>
<td>3</td>
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</tbody>
</table>

Total Credit Hours 30

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### Required Courses (12 credit hours)

**Computer Science (6 credit hours)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CIS 512</td>
<td>INTRODUCTION TO DATA SCIENCE AND ANALYTICS</td>
<td>3</td>
</tr>
<tr>
<td>CIS 600</td>
<td>MACHINE LEARNING FOR DATA SCIENCE</td>
<td>3</td>
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**Mathematics and Statistics (6 credit hours)**

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>MAT 646</td>
<td>INTRODUCTION TO STATISTICS FOR DATA SCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>MAT 616</td>
<td>ELEMENTS OF MATHEMATICS, PROGRAMMING AND COMPUTER SCIENCE FOR DATA SCIENCE</td>
<td>3</td>
</tr>
</tbody>
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