Appendix A

Employer Needs Survey Summary and Submissions
<table>
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<tr>
<th></th>
<th>Company</th>
<th>Contact</th>
<th>Would you give hiring preference to applicants with the proposed degree?</th>
<th>Would you give hiring preference to applicants with a concentration in Business Data Analytics?</th>
<th>Would you give hiring preference to applicants with a concentration in Data Science Statistics?</th>
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<td>2</td>
<td>Sightline Retail Management and Consulting</td>
<td>Rachel Harris New Business Development</td>
<td><a href="mailto:e.harris@sightlineretail.com">e.harris@sightlineretail.com</a></td>
<td>479.696.8882</td>
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<td>3</td>
<td>Tyson Foods, Inc. Food Industry</td>
<td>Dawn Drewry VP IT</td>
<td><a href="mailto:dawn.drewry@tyson.com">dawn.drewry@tyson.com</a></td>
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<td>Rock Analytics Consulting: Visual Analytics</td>
<td>Elizabeth Phillips Owner</td>
<td><a href="mailto:e.elizabeth.phillips@gmail.com">e.elizabeth.phillips@gmail.com</a></td>
<td>501.626.3871</td>
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<td>Walmart Retailer SVP, Global Audit</td>
<td>Brandi Joplin</td>
<td><a href="mailto:Brandi.Joplin@walmart.com">Brandi.Joplin@walmart.com</a></td>
<td>479.204.8561</td>
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<td>6</td>
<td>(i)OneStoneEconmm</td>
<td>Meagan Kimmonth Bowman CIO and Co-Founder</td>
<td><a href="mailto:kbranca@onlyonestone.com">kbranca@onlyonestone.com</a> / <a href="mailto:MBowman@onlyonestone.com">MBowman@onlyonestone.com</a></td>
<td>314.495.7629</td>
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<td>7</td>
<td>JB Hunt Transportation &amp; Logistics</td>
<td>Douglas Mettenburg VP Engineering &amp; Technology</td>
<td><a href="mailto:douglas.mettenburg@jbhunt.com">douglas.mettenburg@jbhunt.com</a></td>
<td>479.683.7598</td>
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<td>Would you give hiring preference to applicants with a concentration in Computational Analytics?</td>
<td>Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?</td>
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<td>Yes -- absolutely, as our first preference altogether</td>
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<td>Rock Analytics Consulting: Visual Analytics</td>
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<td>Name</td>
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<td>Would you give hiring preference to applicants with a concentration in Geospatial Data Analytics?</td>
<td>Would you give hiring preference to applicants with a concentration in Operations Analytics?</td>
<td>Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program?</td>
<td>Would your organization provide tuition assistance?</td>
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<td>JB Hunt</td>
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<td>Select any of the types of support your company is willing to provide for this degree program</td>
<td>Would a senior-level representative of your company be willing to be a member of our advisory committee? If so, who?</td>
<td>How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will</td>
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<td>3</td>
<td>Sightline Retail Management and Consulting</td>
<td>On-Site Internships, Part-Time Faculty, Real world data and problems for instructional and practicum use</td>
<td>Yes. <a href="mailto:before@sightlineretail.com">before@sightlineretail.com</a></td>
<td></td>
<td>Locally, there is a tremendous need for analytical talent in Northwest Arkansas. A local source for this talent would benefit this region greatly. Within Tyson, this skillset will help the company optimize productivity and improve animal wellbeing. Within our state as well as nationally, data science will help reduce natural resource consumption such as water, fuel and food waste. Data Science helps corporations reduce costs by optimizing business systems, re-allocating/optimizing human capital and discover previously unknown solutions to business problems that drive the enterprise forward.</td>
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<td>4</td>
<td>Tyson Foods, Inc. Food Industry</td>
<td>On-Site Internships, Part-Time Faculty, Tuition Reimbursement, Real world data and problems for instructional and practicum use</td>
<td>Yes. <a href="mailto:Dawn.drewry@tyson.com">Dawn.drewry@tyson.com</a></td>
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<td>Walmart Retailer</td>
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<td>7</td>
<td>@OneStoneEconom</td>
<td>On-Site Internships, Part-Time Faculty, Tuition Reimbursement, Employee Release Time, Equipment, Real world data and problems for instructional and practicum use</td>
<td>Yes. Meagan Kinmonth Bowman</td>
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<td>8</td>
<td>JB Hunt Transportation &amp; Logistics</td>
<td>On-Site Internships, Tuition Reimbursement, Employee Release Time, Real world data and problems for instructional and practicum use</td>
<td>Yes. Douglas Mettenburg</td>
<td></td>
<td>By providing more entry-level analytical talent to the region. There is currently a shortage of analytical talent nationwide. By granting this program we will benefit by being able to bring on skilled analytical talent into our recruiting pipeline and grow the talent. This benefits all employers in the local area, region, and State. Also, by investing in growing talent locally, the students are more likely to want to stay local rather than leave. This makes recruiting easier.</td>
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<td>Provide any additional comments about this degree program and concentrations.</td>
<td>Title</td>
<td>Degree Req’d?</td>
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<td>Sightline Retail</td>
<td>Management and Consulting</td>
<td>Tyson would prefer the ability to take advantage of a skillset around Python and R as well as a cloud-based background. Regarding modeling preferences, we will leverage the basic models (Linear Regression, Clustering etc.) but we will increasingly make use of Artificial Neural Networks using libraries such as Tensorflow and Keras. The Tyson data science skillset will also leverage knowledge around Computer Vision and Edge Computing. We would also benefit from a program grounded in practical application of real world business problems and solutions. There would also be benefit in collaborating with the University on Data Science Internships. This provides valuable real-world experience for the students as well as partnership between Tyson and the University's Data Science program.</td>
<td>Replenishment Lead</td>
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<td>Analytics/Forecasting Lead</td>
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<td>Tyson Foods, Inc.</td>
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<td>Rock Analytics</td>
<td>Consulting; Visual Analytics</td>
<td>Data Scientists</td>
<td>Yes</td>
<td>No</td>
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<td>Walmart</td>
<td>Retailer</td>
<td>Data Scientists</td>
<td>BA + 2 yrs or MA + 1 yr</td>
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<td>Manager, Data Scientist</td>
<td>BA + 3 yrs or MA + 2 yrs</td>
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<td>Senior Data Scientist</td>
<td>BA + 5 yrs or MA + 2 yrs</td>
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<td>Staff Data Scientist</td>
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<td>Sr Manager, Data Scientist</td>
<td>BA + 5-6 yrs or MA + 3-4 yrs or PhD</td>
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<td>Principal Data Scientist</td>
<td>BA + 6 yrs or MA +4 yrs or PhD</td>
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<td>Director, Data Scientist</td>
<td>BA + 7 yrs or MA + 5 yrs or PhD</td>
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<td>Sr Director, Data Scientist</td>
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<td>Distinguished Architect, Data Scientist</td>
<td>BA + 8 yrs or MA + 6 yrs</td>
<td>Big data analytics experience</td>
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<td>Assistant Data Scientist</td>
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<td>JB Hunt</td>
<td>Transportation &amp; Logistics</td>
<td>A thorough understanding of algorithms and statistical analysis would be something we are looking for. Too many times, we have interviewed perspective employees who understand a software package vs. model validation and the underlying mechanics of the models. Also, of interest to us is getting exposure to some of the glibre open source platforms such as R &amp; Python. Many programs focus on only large enterprise vendors such as SPSS, SAS, etc. While we do utilize IBM tech, we are also doing cutting-edge work with Python and exposure to Python would be useful to us. In the position titles below, there is the opportunity for growth through (what is described as a &quot;dual career ladder&quot;) with technical and also analogous management titles such as: Manager, Sr. Manager, and Director for Managing IT (technical side of management) and also for Managing the Business and Driving the Business (business side of management). The opportunity for these is to be able to combine both technical and business.</td>
<td>Data Scientist</td>
<td>BA + 2 yrs or MA + 1 yr</td>
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<td>Principal Data Scientist</td>
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<td>Big data analytics experience</td>
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Skills Required for employment in the position:

- Understanding and rigorously analyzing data using relevant software packages
- Applying data science theories to understand the data and make predictions
- Communicating findings in writing
- Communicating findings via public speaking
- Communicating findings via graphical and visualization techniques
- Applying critical thinking skills to solve novel challenges
- Generalizing knowledge from one subject area to another using data science
- Working in a team-based environment
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<td><strong>Name</strong></td>
<td>Type</td>
<td>Project management skills and leading teams</td>
<td>Management of databases</td>
<td>Data cleansing, processing, and wrangling</td>
<td>Relevant work or internship experience</td>
<td>Data privacy, security, and ethics</td>
<td>Data Science applied to business and economics in an organizational setting</td>
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<td>Would you give hiring preference to applicants with a concentration in Data Science Statistics?</td>
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<td>Kent Watson, VP Technology</td>
<td><a href="mailto:kent.watson@metova.com">kent.watson@metova.com</a> 479.200.1379 Yes Yes Yes</td>
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<td>First Orion</td>
<td>For Profit</td>
<td>Allison Nicholas, Director of Recruiting</td>
<td><a href="mailto:anicholas@firstorion.com">anicholas@firstorion.com</a> 501.269.4119 Maybe Maybe Maybe</td>
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<td>Movista, Inc.</td>
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<td>Allyson Malone, Director of People</td>
<td><a href="mailto:Allyson@movista.com">Allyson@movista.com</a> 479.445.8989 Yes Maybe Yes</td>
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<td>Greg Williamson, Manager - HR</td>
<td><a href="mailto:gwilliamson@rrmetro.org">gwilliamson@rrmetro.org</a> 501.375.6717 (x257) Maybe Maybe Maybe</td>
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<td>DXC Technology</td>
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<td>Alan Allgaier, Healthcare Analytics Delivery Manager</td>
<td><a href="mailto:aallgaier@dxc.com">aallgaier@dxc.com</a> 248.495.8107 Yes Yes Maybe</td>
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<td>Would you give hiring preference to applicants with a concentration in Computational Analytics?</td>
<td>Would you give hiring preference to applicants with a concentration in Bioinformatics?</td>
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<td>Would you give hiring preference to applicants with a concentration in Biomedical &amp; Healthcare Informatics?</td>
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<td>Select any of the types of support your company is willing to provide for this degree program</td>
<td>Would a senior-level representative of your company be willing to be a member of our advisory committee? If so, who?</td>
<td>How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will</td>
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<td>Metova, Inc.</td>
<td>Professional Services</td>
<td>On-Site Internships, Employee Release Time, Equipment</td>
<td>Yes. <a href="mailto:kmw.watson@metova.com">kmw.watson@metova.com</a></td>
<td>The data science field is blowing up in the business and technology industry. Arkansas, particularly Northwest Arkansas, has been playing catchup in many areas around developing technology talent. We have a major talent gap in terms of the number of positions open and the number of graduates to fill those positions. Adding a Data Science program at the U of A would help make Northwest Arkansas known as a regional hub for producing IT talent. Additionally, creating a local talent pool will help fill jobs here in NWA vs. in other states or countries. The large employers who need this skillset will hire it where they can find it. Growing and hiring talent here will help further economic development in NWA.</td>
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<td>On-Site Internships, Employee Release Time, Real-world data and problems for instructional and practicum use</td>
<td>Yes. <a href="mailto:Joel.Sporleder@movista.com">Joel.Sporleder@movista.com</a></td>
<td>This program would benefit us through creating a currently unavailable workforce, opening the door to a new economic stream, and also position us to become the known experts in a rapidly evolving field. In addition to creating new opportunities for employees and employer, this degree would lessen the need to &quot;look elsewhere&quot; for solutions to field related challenges.</td>
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<td>We have a delivery center in Conway. I could move Data Scientist work there if there were a concentration of people there who are qualified.</td>
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Provide any additional comments about this degree program and concentrations.

We are very excited about the potential of this program. Please let us know what we could possibly do to help.

This degree program could supplement preferred degrees in urban and transportation planning.

There is no such thing as a Data Scientist "in the abstract." One needs to be knowledgeable about the business of something. Your 6-point "outcomes" introductory page was silent on that. The best bet for students is to take a minor in a field of interest that they want to perform their craft in, such as business, or healthcare, or engineering, etc., and not just be a pure technician.
<table>
<thead>
<tr>
<th>A</th>
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<th>AB</th>
<th>AC</th>
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<tbody>
<tr>
<td><strong>Company</strong></td>
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<td><strong>Type</strong></td>
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<td># of Positions Currently Open</td>
<td># of Positions per Year Available in Next 2-5 Years</td>
<td># of Positions per Year Available in Next 6-10 Years</td>
<td>Average Starting Salary</td>
<td>Average Annual Salary Increase</td>
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<td>Collecting data via research techniques</td>
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<td>Type</td>
<td>Understanding and rigorously analyzing data using relevant software packages</td>
<td>Applying data science theories to understand the data and make predictions</td>
<td>Communicating findings in writing</td>
<td>Communicating findings via graphical and visualization techniques</td>
<td>Applying critical thinking skills to solve novel challenges</td>
<td>Generalizing knowledge from one subject area to another using data science</td>
<td>Working in a team-based environment</td>
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<td>16</td>
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<td>For Profit</td>
<td>X</td>
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<td>X</td>
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</tr>
</tbody>
</table>

Skills Required for employment in the position:

- Project management skills and leading teams
- Management of databases
- Data cleansing, processing, and wrangling
- Relevant work or internship experience
- Data privacy, security, and ethics
- Data Science applied to business and economics in an organizational setting
B.S. Data Science Degree Program

The University of Arkansas Bachelor of Science in Data Science major will prepare students for a successful career in data science with a solid amalgamation of given capabilities:

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- an ability to develop descriptive, predictive, and prescriptive mathematical/statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data,

- an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and societal and ethical impacts,

- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

- an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another.
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

1. Please complete this information about your organization, as a potential employer:

- **Company Name**: Sightline Retail
- **Type of Company**: Management and Consulting
- **Contact Person**: Rachel Harris
- **Position Title**: New Business Development
- **Email**: r.harris@sightlineretail.com
- **Phone**: 479-696-8882

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

- **Job Title 1**: Replenishment Lead
- **Job Title 2**: Analytics/Forecasting Lead
- **Job Title 3**: ________________________________
- **Job Title 4**: ________________________________
- **Job Title 5**: ________________________________
- **Job Title 6**: ________________________________
- **Job Title 7**: ________________________________
- **Job Title 8**: ________________________________
- **Job Title 9**: ________________________________
- **Job Title 10**: ________________________________

3. Please complete the following information, for each job title listed above, on the following pages:
<table>
<thead>
<tr>
<th>Job Title</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Title 1</td>
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<td>Job Title</td>
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<td># of Positions Currently Filled</td>
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<td># of Positions per Year Available in Next 2-5 Years</td>
<td># of Positions per Year Available in Next 6-10 Years</td>
<td>Average Starting Annual Salary</td>
<td>Average Annual Salary Increase</td>
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<td>Job Title 10</td>
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</tbody>
</table>
4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
<thead>
<tr>
<th>Job Title 1</th>
<th>Evaluating the quality of data</th>
<th>Collecting data via research techniques</th>
<th>Understanding and rigorously analyzing data using relevant software packages</th>
<th>Applying data science theories to understand the data and make predictions</th>
<th>Communicating findings in writing</th>
<th>Communicating findings via public speaking</th>
<th>Communicating findings via graphical and visualization techniques</th>
<th>Applying critical thinking skills to solve novel challenges</th>
</tr>
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<tr>
<td>Generalizing knowledge from one subject area to another using data science</td>
<td>Working in a team-based environment</td>
<td>Project management skills and leading teams</td>
<td>Management of databases</td>
<td>Data cleansing, processing, and wrangling</td>
<td>Relevant work or internship experience</td>
<td>Data privacy, security, and ethics</td>
<td>Data science applied to business and economics in an organizational setting</td>
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</tbody>
</table>
5. Would you give hiring preference to applicants with the proposed degree?
   X Yes
   O Maybe
   O No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?
   X Yes
   O Maybe
   O No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?
   X Yes (if there were business classes taken as well)
   O Maybe
   O No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?
   O Yes
   O Maybe
   X No- but its possible we don’t fully understand this degree and the application in a business environment

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?
   X Yes
   O Maybe
   O No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?
   O Yes
   O Maybe
   X No

5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   X Yes–absolutely, as our first preference altogether.
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

〇 Maybe
〇 No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? (our employees already have degrees, so unclear on what this question is asking?)

7. Would your organization provide tuition assistance?
   〇 Yes
   X Maybe
   〇 No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Days/Times</th>
<th>Mediums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-Person</td>
</tr>
<tr>
<td>Days</td>
<td></td>
</tr>
<tr>
<td>Evenings</td>
<td></td>
</tr>
<tr>
<td>Weekends</td>
<td></td>
</tr>
</tbody>
</table>

Helpful at all

Preference

□ □ □ □ □ □ □
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds
☐ On-site Internships
☐ Part-Time Faculty

☐ Tuition Reimbursement

☐ Employee Release Time

☐ Equipment
☐ X Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: bedores@sightlineretail.com________________________________________

☐ Yes, they would. Please provide preferred email: ________________________________

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

12. Provide any additional comments about this degree program and concentrations.

________________________________________________________________________
Please return completed surveys by Friday, September 14, 2018 to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research
for Innovation and Data Science Initiatives
University of Arkansas
B.S. Data Science Degree Program

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- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

- an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another.
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

1. Please complete this information about your organization, as a potential employer:

- Company Name: Tyson Foods Inc
- Type of Company: Food Industry
- Contact Person: Dawn Drewry
- Position Title: VP IT
- Email: dawn.drewry@tyson.com
- Phone: 

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

- Job Title 1 Data Scientists
- Job Title 2 Data Analysts
- Job Title 3
- Job Title 4
- Job Title 5
- Job Title 6
- Job Title 7
- Job Title 8
- Job Title 9
- Job Title 10

3. Please complete the following information, for each job title listed above, on the following pages:
### University of Arkansas B.S. Data Science Degree Program
#### Employer Needs Survey

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
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<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Scientist</td>
<td>Yes</td>
<td>No</td>
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<td>3</td>
<td>3</td>
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<td>95000</td>
<td>3-5%</td>
</tr>
<tr>
<td>Data Analyst/Citizen Data Scientist</td>
<td>Yes</td>
<td>No</td>
<td>30</td>
<td>5</td>
<td>10</td>
<td>12</td>
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<td>3-5%</td>
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### Generalizing knowledge from one subject area to another using data science

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5. Would you give hiring preference to applicants with the proposed degree?
   X - Yes
   O Maybe
   O No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?
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   O No

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   X - Yes
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5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?
   X - Yes
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5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?
   X - Yes
   O Maybe
   O No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?
   X - Yes
   O Maybe
   O No
5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   - X - Yes
   - O Maybe
   - O No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? __40________________________

7. Would your organization provide tuition assistance?
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   - O Maybe
   - O No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

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University of Arkansas B.S. Data Science Degree Program  
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds
X - On-site Internships
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☐ Equipment
X - Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: ___________________________________
X - Yes, they would. Please provide preferred email: _dawn.drewry@tyson.com_____

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

Locally, there is a tremendous need for analytical talent in Northwest Arkansas. A local source for this talent would benefit this region greatly.

Within Tyson, this skillset will help the company optimize productivity and improve animal wellbeing.

Within our state as well as nationally, data science will help reduce natural resource consumption such as water, fuel and food waste.

Data Science helps corporations reduce costs by optimizing business systems, re-allocating/optimizing human capital and discover previously unknown solutions to business problems that drive the enterprise forward.
12. Provide any additional comments about this degree program and concentrations.

Tyson would prefer the ability to take advantage of a skillset around Python and R as well as a cloud-based background.

Regarding modeling preferences, we will leverage the basic models (Linear Regression, Clustering etc.) but we will increasingly make use of Artificial Neural Networks using libraries such as Tensorflow and Keras.

The Tyson data science skillset will also leverage knowledge around Computer Vision and Edge Computing

We would also benefit from a program grounded in practical application of real world business problems and solutions.

There would also be benefit in collaborating with the University on Data Science Internships. This provides valuable real-world experience for the students as well as partnership between Tyson and the Universities Data Science program.

Please return completed surveys by **Friday, September 14, 2018** to:

[karl.schubert@uark.edu](mailto:karl.schubert@uark.edu)

Karl D. Schubert, Ph.D., FIET  
Research Professor and Director of Research  
for Innovation and Data Science Initiatives  
University of Arkansas
The University of Arkansas Bachelor of Science in Data Science major will prepare students for a successful career in data science with a solid amalgamation of given capabilities:

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- an ability to develop descriptive, predictive, and prescriptive mathematical/statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data,

- an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and societal and ethical impacts,

- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

- an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another.
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

1. Please complete this information about your organization, as a potential employer:

   ○ Company Name: Rock Analytics
   ○ Type of Company: Consulting: Visual Analytics
   ○ Contact Person: Elizabeth Phillips
   ○ Position Title: Owner
   ○ Email: a.elizabeth.phillips@gmail.com
   ○ Phone: 501.626.3871

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

   ○ Job Title 1 Visual Analyst
   ○ Job Title 2 Developer, Coding Expert
   ○ Job Title 3 __________________________________________________
   ○ Job Title 4 __________________________________________________
   ○ Job Title 5 __________________________________________________
   ○ Job Title 6 __________________________________________________
   ○ Job Title 7 __________________________________________________
   ○ Job Title 8 __________________________________________________
   ○ Job Title 9 __________________________________________________
   ○ Job Title 10__________________________________________________________________________

3. Please complete the following information, for each job title listed above, on the following pages:
<table>
<thead>
<tr>
<th>Job Title 1</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics, Statistics, Mathematics, Information Management</td>
<td>Experience Working in Tableau, Microsoft Power BI</td>
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<td>0</td>
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<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
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<tr>
<td>Computer Science, Statistics</td>
<td>Adept at queries (SQL), Experience or familiarity with R, Python, and/or Julia</td>
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University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

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- No X

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Employer Needs Survey

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Research Professor and Director of Research
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University of Arkansas
B.S. Data Science Degree Program

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- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

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1. Please complete this information about your organization, as a potential employer:

- Company Name: Walmart Inc.
- Type of Company: Retailer
- Contact Person: Brandi Joplin
- Position Title: SVP, Global Audit
- Email: Brandi.Joplin@walmart.com
- Phone: 479.204.8561

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

- Job Title 1: Data Scientist
- Job Title 2: Manager, Data Scientist
- Job Title 3: Senior Data Scientist
- Job Title 4: Staff Data Scientist
- Job Title 5: Sr Manager, Data Scientist
- Job Title 6: Principal Data Scientist
- Job Title 7: Director, Data Scientist
- Job Title 8: Distinguished Data Scientist
- Job Title 9: Sr Director, Data Scientist
- Job Title 10: Distinguished Architect Data Scientist

3. Please complete the following information, for each job title listed above, on the following pages:
<table>
<thead>
<tr>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Scientist</td>
<td>BA + 2 years; or MA + 1</td>
<td>36</td>
<td>6</td>
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<tr>
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<tr>
<td>Sr Manager, Data Scientist</td>
<td>BA + 5-6 years; or MA + 3-4; or PhD</td>
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<tr>
<td>Distinguished Data Scientist</td>
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<tr>
<td>Sr Director, Data Scientist</td>
<td>BA + 8 years; or MA + 6</td>
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</tr>
<tr>
<td>Distinguished Architect Data Scientist</td>
<td>BA + 8 years; or MA + 6</td>
<td>Big Data analytics experience</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Please select all the skills that individuals would need for employment in the positions listed:

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<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Manager, Data Scientist</td>
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</tr>
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</tr>
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<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
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<td>Principal Data Scientist</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
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   - Yes
   - **Maybe**
   - No

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   - Yes
   - **Maybe**
   - No

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   - Yes
   - **Maybe**
   - No

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   - Yes
   - **Maybe**
   - No

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   - Yes
   - **Maybe**
   - No

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   - **Maybe**
   - No
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- Maybe
- No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? ______________

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<tr>
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<th>Evenings</th>
<th>Weekends</th>
<th>Mediums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpful at all</td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ] ![ ]</td>
</tr>
<tr>
<td>Preference</td>
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<td>![ ]</td>
<td>![ ] ![ ]</td>
</tr>
</tbody>
</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

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☐ On-site Internships
☐ Part-Time Faculty
☐ Tuition Reimbursement
☐ Employee Release Time
☐ Equipment
☐ Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: ________________________________

☐ Yes, they would. Please provide preferred email: ________________________________

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

12. Provide any additional comments about this degree program and concentrations.

__________________________________________________________________________
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__________________________________________________________________________
__________________________________________________________________________

Please return completed surveys by **Friday, September 14, 2018** to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research
for Innovation and Data Science Initiatives
University of Arkansas
B.S. Data Science Degree Program

The University of Arkansas Bachelor of Science in Data Science major will prepare students for a successful career in data science with a solid amalgamation of given capabilities:

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- an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

- an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another.
1. Please complete this information about your organization, as a potential employer:
   - Company Name: ____________________________________________
   - Type of Company: __________________________________________
   - Contact Person: ____________________________________________
   - Position Title: _____________________________________________
   - Email: ____________________________________________________
   - Phone: ____________________________________________________

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:
   - Job Title 1: Associate Data Scientist__________________________
   - Job Title 2: Data Analyst____________________________________
   - Job Title 3: Data Entry Engineer______________________________
   - Job Title 4: ______________________________________________
   - Job Title 5: ______________________________________________
   - Job Title 6: ______________________________________________
   - Job Title 7: ______________________________________________
   - Job Title 8: ______________________________________________
   - Job Title 9: ______________________________________________
   - Job Title 10: _____________________________________________

3. Please complete the following information, for each job title listed above, on the following pages:
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<th>Job Title 1</th>
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<th>0</th>
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<th>Cost of living + performance</th>
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<td>Cost of living + performance</td>
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<tr>
<td>Job Title</td>
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<td># of Positions Currently Filled</td>
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</table>
4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
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<th></th>
<th>Evaluating the quality of data</th>
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</tbody>
</table>
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O Yes
X Maybe
O No

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O Yes
X Maybe
O No

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O Maybe
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O Maybe
X No

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O Maybe
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O Maybe
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   - O Maybe
   - O No

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<th>Mediums</th>
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<td>Days</td>
<td>Evenings</td>
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<tr>
<td>In-Person</td>
<td>Online</td>
</tr>
</tbody>
</table>

   - Helpful at all
     - [ ] Days
     - [ ] Evenings
     - [ ] Weekends
     - [ ] In-Person
     - [ ] Online

   - Preference
     - [ ] Days
     - [ ] Evenings
     - [X] Weekends
     - [ ] In-Person
     - [X] Online
University of Arkansas B.S. Data Science Degree Program
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3. an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and societal and ethical impacts,

4. an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers, and

5. an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another, and

6. an ability to communicate in written, verbal, technical, and non-technical forms.
1. Please complete this information about your organization, as a potential employer:

- Company Name: Metova, Inc.
- Type of Company: Professional services
- Contact Person: Kent Watson
- Position Title: VP Technology
- Email: kent.watson@metova.com
- Phone: 479-200-1379

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

- Job Title 1: Data Engineer
- Job Title 2: Machine Learning Engineer
- Job Title 3: Data Scientist
- Job Title 4: Business Analyst
- Job Title 5
- Job Title 6
- Job Title 7
- Job Title 8
- Job Title 9
- Job Title 10

3. Please complete the following information, for each job title listed above, on the following pages:
<table>
<thead>
<tr>
<th>Job Title</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
</thead>
<tbody>
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<td># of Positions Currently Filled</td>
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<td># of Positions per Year Available in Next 2-5 Years</td>
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</table>
4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
<thead>
<tr>
<th>Job Title 1</th>
<th>Evaluating the quality of data</th>
<th>Collecting data via research techniques</th>
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<th>Applying critical thinking skills to solve novel challenges</th>
</tr>
</thead>
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<tr>
<td>Job Title</td>
<td>Generalizing knowledge from one subject area to another using data science</td>
<td>Working in a team-based environment</td>
<td>Project management skills and leading teams</td>
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<td>Data cleansing, processing, and wrangling</td>
<td>Relevant work or internship experience</td>
<td>Data privacy, security, and ethics</td>
<td>Data science applied to business and economics in an organizational setting</td>
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<td>□</td>
</tr>
</tbody>
</table>
5. Would you give hiring preference to applicants with the proposed degree?
   - X Yes
   - O Maybe
   - O No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?
   - X Yes
   - O Maybe
   - O No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?
   - X Yes
   - O Maybe
   - O No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?
   - X Yes
   - O Maybe
   - O No

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?
   - O Yes
   - X Maybe
   - O No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?
   - O Yes
   - X Maybe
   - O No

5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   - O Yes
University of Arkansas B.S. Data Science Degree Program  
Employer Needs Survey

X Maybe  
☐ No

5g. Would you give hiring preference to applicants with a concentration in Biomedical &  
Healthcare Informatics?

☐ Yes  
X Maybe  
☐ No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in  
the proposed degree program?  

☐ 10

7. Would your organization provide tuition assistance?

☐ Yes  
X Maybe  
☐ No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person  
or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Days/Times</th>
<th>Mediums</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Days</td>
</tr>
<tr>
<td>Helpful at all</td>
<td>☐</td>
</tr>
<tr>
<td>Preference</td>
<td>☐</td>
</tr>
</tbody>
</table>
9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds
X On-site Internships
☐ Part-Time Faculty
☐ Tuition Reimbursement
X Employee Release Time
X Equipment
☐ Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

X Yes, I will. Please provide preferred email: __kent.watson@metova.com____________________

☐ Yes, they would. Please provide preferred email: __________________________

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

_The data science field is blowing up in the business world and technology industry. Arkansas, particularly Northwest Arkansas has been playing catchup in many areas around developing technology talent. We have a major talent gap in terms of the number of positions open and the number of graduates to fill those positions. Adding a Data Science program at the U of A would help make Northwest Arkansas known as a regional hub for producing IT talent. Additionally, creating a local talent pool will help fill jobs here in NWA vs. in other states or countries. The large employers who need this skillset will hire it where they can find it. Growing and hiring talent here will help further economic development in NWA._
12. Provide any additional comments about this degree program and concentrations.

__________________________________________________________________________
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Please return completed surveys by **Friday, December 14, 2018** to:

[karl.schubert@uark.edu](mailto:karl.schubert@uark.edu)

Karl D. Schubert, Ph.D., FIET  
Research Professor and Director of Research for Innovation and Data Science Initiatives  
University of Arkansas
U of A B.S. Data Science Degree Program Outcomes

The U of A Bachelor of Science in Data Science major will prepare students for a successful career in data science with an amalgamation of capabilities:

1. an ability to use information systems, statistics, and computer science principles and apply state-of-the-art technologies for data representation, data retrieval, data manipulation, data storage, data governance, data security, machine learning, computational analytics, and data analysis and visualization;

2. an ability to develop descriptive, predictive, and prescriptive mathematical and statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data;

3. an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and an awareness of societal and ethical impacts;

4. an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers;

5. an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another; and,

6. an ability to communicate in written, verbal, technical, and non-technical forms.
1. Please complete this information about your organization, as a potential employer:

   - Company Name: __First Orion______________________________________________
   - Type of Company: ___For profit____________________________________________
   - Contact Person: ___Allison Nicholas________________________________________
   - Position Title: ___Director of Recruiting____________________________________
   - Email: ___anicholas@firstorion.com________________________________________
   - Phone: __501.269.4119_______________________________________________________

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

   - Job Title 1 ___Data Scientist______________________________________________
   - Job Title 2 ___Data Science Apprenticeship_______________________________
   - Job Title 3 ___Data Analyst Apprenticeship________________________________
### University of Arkansas B.S. Data Science Degree Program

#### Employer Needs Survey

3. Please complete the following information, for each job title listed above, on the following pages:

<table>
<thead>
<tr>
<th>Job Title 1</th>
<th>Data Scientist</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
</tr>
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<td>Job Title 2</td>
<td>Data Science Apprentice</td>
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<td>Job Title 3</td>
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Please return by Friday, March 22, 2019.
4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Evaluating the quality of data</th>
<th>Collecting data via research techniques</th>
<th>Understanding and rigorously analyzing data using relevant software packages</th>
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<th>Applying critical thinking skills to solve novel challenges</th>
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</thead>
<tbody>
<tr>
<td>Job Title 1</td>
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<tr>
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<td>Data science applied to business and economics in an organizational setting</td>
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</tr>
</tbody>
</table>
5. Would you give hiring preference to applicants with the proposed degree?
   ○ Yes
   X Maybe
   ○ No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?
   ○ Yes
   X Maybe
   ○ No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?
   ○ Yes
   X Maybe
   ○ No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?
   ○ Yes
   X Maybe
   ○ No

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?
   ○ Yes
   X Maybe
   ○ No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?
   ○ Yes
   ○ Maybe
5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   - Yes
   - Maybe
   - No

5g. Would you give hiring preference to applicants with a concentration in Biomedical & Healthcare Informatics?
   - Yes
   - Maybe
   - No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? _____ 0 ________________

7. Would your organization provide tuition assistance?
   - Yes
   - Maybe
   - No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Helpful at all</th>
<th>Days</th>
<th>Evenings</th>
<th>Weekends</th>
<th>In-Person</th>
<th>Online</th>
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</thead>
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<tr>
<th>Preference</th>
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<th>Evenings</th>
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</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds
X On-site Internships
☐ Part-Time Faculty
☐ Tuition Reimbursement
X Employee Release Time
☐ Equipment

X Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: _____________________________

☐ Yes, they would. Please provide preferred email: _____________________________

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

12. Provide any additional comments about this degree program and concentrations.

________________________________________________________________________
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

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Thank you very much for providing us your valuable feedback – we very much appreciate it!

Please return this completed survey by *Friday, March 22, 2019* to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research
for Innovation and Data Science Initiatives
University of Arkansas

March 11, 2019

*please return by Friday, March 22, 2019*

Page 9 of 9
U of A B.S. Data Science Degree Program Outcomes

The U of A Bachelor of Science in Data Science major will prepare students for a successful career in data science with an amalgamation of capabilities:

1. an ability to use information systems, statistics, and computer science principles and apply state-of-the-art technologies for data representation, data retrieval, data manipulation, data storage, data governance, data security, machine learning, computational analytics, and data analysis and visualization;

2. an ability to develop descriptive, predictive, and prescriptive mathematical and statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data;

3. an ability to use foundational knowledge and apply critical thinking skills to problem identification, problem solving, decision making, visualization, and an awareness of societal and ethical impacts;

4. an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers;

5. an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another; and,

6. an ability to communicate in written, verbal, technical, and non-technical forms.
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

1. Please complete this information about your organization, as a potential employer:
   - Company Name:  Movista Inc.
   - Type of Company:  Technology - Software as a Service
   - Contact Person:  Allyson Malone
   - Position Title:  Director of People
   - Email:  Allyson@movista.com
   - Phone:  479-445-8989

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:
   - Job Title 1  Director of Data Insights
   - Job Title 2  Data Science Engineer
   - Job Title 3  Data Analytics Engineer
   - Job Title 4  Machine Learning Engineer
   - Job Title 5  Behavioral Science Analyst (Human Computer Interaction)
   - Job Title 6
   - Job Title 7
   - Job Title 8
   - Job Title 9
   - Job Title 10

3. Please complete the following information, for each job title listed above, on the following pages:

March 11, 2019  Please return by Sunday, March 31, 2019  Page 2 of 10
<table>
<thead>
<tr>
<th>Job Title</th>
<th>Degree Required</th>
<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
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<td>2</td>
<td>$120,000</td>
<td>5-10%</td>
</tr>
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</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
<thead>
<tr>
<th>Skill</th>
<th>Evaluating the quality of data</th>
<th>Collecting data via research techniques</th>
<th>Understanding and rigorously analyzing data using relevant software packages</th>
<th>Applying data science theories to understand the data and make predictions</th>
<th>Communicating findings in writing</th>
<th>Communicate findings via public speaking</th>
<th>Communicating findings via graphical and visualization techniques</th>
<th>Applying critical thinking skills to solve novel challenges</th>
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March 11, 2019

*please return by Sunday, March 31, 2019*
<table>
<thead>
<tr>
<th>Generalizing knowledge from one subject area to another using data science</th>
<th>Working in a team-based environment</th>
<th>Project management skills and leading teams</th>
<th>Management of databases</th>
<th>Data cleansing, processing, and wrangling</th>
<th>Relevant work or internship experience</th>
<th>Data privacy, security, and ethics</th>
<th>Data science applied to business and economics in an organizational setting</th>
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<td>□</td>
</tr>
</tbody>
</table>

*please return by Sunday, March 31, 2019*
5. Would you give hiring preference to applicants with the proposed degree?
   - Yes
   - Maybe
   - No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?
   - Yes
   - Maybe
   - No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?
   - Yes
   - Maybe
   - No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?
   - Yes
   - Maybe
   - No

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?
   - Yes
   - Maybe
   - No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?
   - Yes
5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?

- Yes
- Maybe
- No

5g. Would you give hiring preference to applicants with a concentration in Biomedical & Healthcare Informatics?

- Yes
- Maybe
- No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? ___10-15__________________________

7. Would your organization provide tuition assistance?

- Yes
- Maybe
- No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Help at all</th>
<th>Days</th>
<th>Evenings</th>
<th>Weekends</th>
<th>In-Person</th>
<th>Online</th>
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<td>Yes</td>
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</tr>
</tbody>
</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:
   - [X] Program Start-Up Funds
   - [X] On-site Internships
   - [ ] Part-Time Faculty
   - [X] Tuition Reimbursement
   - [X] Employee Release Time
   - [ ] Equipment
   - [X] Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?
   - [ ] Yes, I will. Please provide preferred email: ___Joel.Sporleder@movista.com__________
   - [ ] Yes, they would. Please provide preferred email: ____________________________
   - [ ] No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

   ______This program would benefit us through creating a currently unavailable workforce, opening the door to a new economic stream, and also position us to become the known experts in a rapidly evolving field. In addition to creating new opportunities for employees and employer, this degree would lessen the need to “look elsewhere” for solutions to field related challenges.

   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
12. Provide any additional comments about this degree program and concentrations.

We are very excited about the potential of this program. Please let us know what we could possibly do to help.

__________________________________________________________________________
__________________________________________________________________________
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__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Thank you very much for providing us your valuable feedback – we very much appreciate it!

Please return this completed survey by **Sunday, March 31, 2019** to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research
for Innovation and Data Science Initiatives
University of Arkansas
U of A B.S. Data Science Degree Program Outcomes

The U of A Bachelor of Science in Data Science major will prepare students for a successful career in data science with an amalgamation of capabilities:

1. an ability to use information systems, statistics, and computer science principles and apply state-of-the-art technologies for data representation, data retrieval, data manipulation, data storage, data governance, data security, machine learning, computational analytics, and data analysis and visualization;

2. an ability to develop descriptive, predictive, and prescriptive mathematical and statistical models to provide abstractions of complex systems and organizational problems and to apply computational methods to draw conclusions supported by data;

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6. an ability to communicate in written, verbal, technical, and non-technical forms.
University of Arkansas B.S. Data Science Degree Program  
Employer Needs Survey

1. Please complete this information about your organization, as a potential employer:

   - Company Name: Rock Region METRO
   - Type of Company: Mixed Mode Transit System
   - Contact Person: Greg Williamson
   - Position Title: Manager - HR
   - Email: gwilliamson@rrmetro.org
   - Phone: 501-375-6717 (257)

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

   - Job Title 1: Transit Planner
   - Job Title 2: Planning and Safety Officer
   - Job Title 3
   - Job Title 4
   - Job Title 5
   - Job Title 6
   - Job Title 7
   - Job Title 8
   - Job Title 9
   - Job Title 10

3. Please complete the following information, for each job title listed above, on the following pages:

March 11, 2019  
Please return by Friday, March 22, 2019  
Page 2 of 10
| Job Title 1 | Urban or Transportation Planning | 1 | none | $55K | 3.9% |
| Job Title 2 | Urban or Transportation Planning | Budgeted for Future | none | $90K | 3.9% |

March 11, 2019

*please return by Friday, March 22, 2019*
<table>
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</table>
4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
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<tr>
<th>Job Title</th>
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<td></td>
</tr>
</tbody>
</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

5. Would you give hiring preference to applicants with the proposed degree?
   
   ☐ Yes
   ☑ Maybe
   ☐ No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?

   ☐ Yes
   ☑ Maybe
   ☐ No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?

   ☐ Yes
   ☑ Maybe
   ☐ No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?

   ☐ Yes
   ☑ Maybe
   ☐ No

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?

   ☐ Yes
   ☑ Maybe
   ☐ No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?

   ☐ Yes
   ☐ Maybe
   ☑ No

March 11, 2019  please return by Friday, March 22, 2019  Page 7 of 10
5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   - Yes
   - Maybe
   - No

5g. Would you give hiring preference to applicants with a concentration in Biomedical & Healthcare Informatics?
   - Yes
   - Maybe
   - No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? [2 - 5]

7. Would your organization provide tuition assistance?
   - Yes
   - Maybe
   - No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Helpful at all</th>
<th>Days</th>
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<td>In-Person</td>
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<tr>
<td>Preference</td>
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<td></td>
<td></td>
<td>In-Person</td>
</tr>
</tbody>
</table>

please return by Friday, March 22, 2019
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds
☐ On-site Internships
☐ Part-Time Faculty
☐ Tuition Reimbursement
☐ Employee Release Time
☐ Equipment
✓ Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: ________________________________

✓ Yes, they would. Please provide preferred email: grwilliamson@rrmehv.org

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

12. Provide any additional comments about this degree program and concentrations.

____________________________________________________________________
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

This degree program could supplement preferred degrees in Urban and Transportation Planning.

Thank you very much for providing us your valuable feedback – we very much appreciate it!

Please return this completed survey by Friday, March 22, 2019 to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research for Innovation and Data Science Initiatives
University of Arkansas
U of A B.S. Data Science Degree Program Outcomes

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4. an ability to adapt analytics concepts to interpret and communicate findings and implications to senior decision makers;

5. an ability to work effectively in multidisciplinary teams and transfer findings from one knowledge domain to another; and,

6. an ability to communicate in written, verbal, technical, and non-technical forms.
1. Please complete this information about your organization, as a potential employer:

- Company Name: **DXC Technology**
- Type of Company: 
- Contact Person: **Alan Allgaier**
- Position Title: **Own Healthcare Analytics Delivery**
- Email: **AAllgaier@DXC.com**
- Phone: **248 495 8107**

2. List job titles with your company that require employees to have the knowledge and skills obtained from the proposed concentration program:

- Job Title 1: **Data Scientist**
- Job Title 2
- Job Title 3
- Job Title 4
- Job Title 5
- Job Title 6
- Job Title 7
- Job Title 8
- Job Title 9
- Job Title 10

3. Please complete the following information, for each job title listed above, on the following pages:
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<th>Certification or Licensure Required</th>
<th># of Positions Currently Filled</th>
<th># of Positions Currently Open</th>
<th># of Positions per Year Available in Next 2-5 Years</th>
<th># of Positions per Year Available in Next 6-10 Years</th>
<th>Average Starting Annual Salary</th>
<th>Average Annual Salary Increase</th>
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March 11, 2019 please return by Friday, March 22, 2019
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</table>
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

4. Please select all the skills that individuals would need for employment in the positions listed:

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Evaluating the quality of data</th>
<th>Collecting data via research techniques</th>
<th>Understanding and rigorously analyzing data using relevant software packages</th>
<th>Applying data science theories to understand the data and make predictions</th>
<th>Communicating findings in writing</th>
<th>Communicate findings via public speaking</th>
<th>Communicating findings via graphical and visualization techniques</th>
<th>Applying critical thinking skills to solve novel challenges</th>
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<tbody>
<tr>
<td>Job Title 1</td>
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</table>

March 11, 2019

*please return by Friday, March 22, 2019*
### Generalizing knowledge from one subject area to another using data science

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Working in a team-based environment</th>
<th>Project management skills and leading teams</th>
<th>Management of databases</th>
<th>Data cleansing, processing, and wrangling</th>
<th>Relevant work or internship experience</th>
<th>Data privacy, security, and ethics</th>
<th>Data science applied to business and economics in an organizational setting</th>
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</thead>
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</tbody>
</table>
5. Would you give hiring preference to applicants with the proposed degree?

☐ Yes  
☐ Maybe  
☐ No

5a. Would you give hiring preference to applicants with a concentration in Business Data Analytics?

☐ Yes  
☐ Maybe  
☐ No

5b. Would you give hiring preference to applicants with a concentration in Data Science Statistics?

☐ Yes  
☐ Maybe  
☐ No

5c. Would you give hiring preference to applicants with a concentration in social data science, emphasizing social impacts of data analytics?

☐ Yes  
☐ Maybe  
☑ No

5d. Would you give hiring preference to applicants with a concentration in Computational Analytics?

☐ Yes  
☐ Maybe  
☐ No

5e. Would you give hiring preference to applicants with a concentration in Bioinformatics?

☐ Yes  
☐ Maybe  
☐ No
5f. Would you give hiring preference to applicants with a concentration in Supply Chain Analytics?
   ○ Yes
   ○ Maybe
   ○ No

5g. Would you give hiring preference to applicants with a concentration in Biomedical & Healthcare Informatics?
   ○ Yes
   ○ Maybe
   ○ No

6. Indicate the number of employees who would benefit from enrolling in selected coursework in the proposed degree program? ______________

7. Would your organization provide tuition assistance?
   ○ Yes
   ○ Maybe
   ○ No

8. Please select any of the days and times (days/evening/weekend classes) and mediums (in-person or online classes) that would be helpful for your employees:

<table>
<thead>
<tr>
<th>Helpfulness</th>
<th>Days</th>
<th>Evenings</th>
<th>Weekends</th>
<th>In-Person</th>
<th>Online</th>
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<tr>
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<tr>
<td>Preference</td>
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</table>

March 11, 2019

please return by Friday, March 22, 2019
University of Arkansas B.S. Data Science Degree Program
Employer Needs Survey

9. Please select any of the types of support your company are willing to provide for the B.S. Data Science Degree Program:

☐ Program Start-Up Funds

☐ On-site Internships

☐ Part-Time Faculty

☐ Tuition Reimbursement

☐ Employee Release Time

☐ Equipment

☐ Real world data and problems for instructional and practicum use

10. Would a senior-level representative of your company be willing to be a member of our advisory committee?

☐ Yes, I will. Please provide preferred email: ______________________________________

☐ Yes, they would. Please provide preferred email: ______________________________________

☐ No

11. How will this degree program benefit your local community, the state, region, or nation? Please also explain why it will.

We have a delivery center in Conway, I could move data scientist work there, if there were a concentration of people those who are qualified.
12. Provide any additional comments about this degree program and concentrations.

There is no such thing as a data scientist "in the abstract", one needs to be knowledgeable about the business of something. Your 6-point "outcomes" introductory page was silent on that.

The best bet for students is to take a minor in a field of interest that they want to perform their craft in, such as business, or healthcare, or engineering, etc. And not just be a pure technician.

Thank you very much for providing us your valuable feedback – we very much appreciate it!

Please return this completed survey by Friday, March 22, 2019 to:

karl.schubert@uark.edu

Karl D. Schubert, Ph.D., FIET
Research Professor and Director of Research
for Innovation and Data Science Initiatives
University of Arkansas

March 11, 2019
Appendix B
DASCBS Curriculum
and 8-Semester Suggested Plan of Study
Requirements for B.S. in Data Science

Each student in Data Science is required to complete 120 hours of coursework including the University Core (http://catalog.uark.edu/undergraduategatalog/academicregulations/universitycore). To be eligible for graduation, all students must complete at least 60 hours of Data Science (DASC) Core classes at the University of Arkansas, Fayetteville that are required for the degree. Each student in Data Science is also required to complete an additional 20-21 hours (depending on the student's chosen Concentration) of required and elective Concentration courses to meet the requirements for a Concentration to better prepare them for employment or further study in areas such as:

- Accounting Analytics
- Bioinformatics
- Biomedical and Healthcare Informatics
- Business Data Analytics
- Computational Analytics
- Data Science Statistics
- Geospatial Data Analytics
- Operations Analytics
- Social Data Analytics
- Supply Chain Analytics

Additional opportunities are available to enhance the educational experience of students in these areas. Students should consult their academic advisor for recommendations.

**University Core and General Education**

**36 credit hours**

ENGL 1013 Composition I (ACTS Equivalency = ENGL 1013)

Choose one of the following:

ENGL 1033 Technical Composition II (ACTS Equivalency = ENGL 1023)

or ENGL 1023 Composition II (ACTS Equivalency = ENGL 1023)

MATH 2554 Calculus I (ACTS Equivalency = MATH 2405)

University Core Science Electives - (two courses with labs)

University Core Fine Arts - 3 credit hours

University Core Humanities - (Students are required to complete PHIL 3103)

PHIL 3103 Ethics and the Professions

Choose one of the following:

HIST 2003 History of the American People to 1877 (ACTS Equivalency = HIST 2113)

HIST 2013 History of the American People, 1877 to Present (ACTS Equivalency = HIST 2123)

University Core Social Science Elective - 6 credit hours
ECON 2143 Basic Economics: Theory and Practice (represents 3 of the 9 required credit hours for Social Science elective)

**Data Science Required Core**
DASC 1001 Introduction to Data Science
DASC 1104 Programming Languages for Data Science (R, Python)
DASC 1204 Introduction to Object Oriented Programming for Data Science (JAVA)
DASC 2594 Multivariable Math for Data Scientists
DASC 1222 Role of Data Science in Today's World
DASC 2103 Data Structures & Algorithms
DASC 2113 Principles & Techniques of Data Science
DASC 2203 Data Management & Data Base
DASC 2213 Data Visualization & Communication (Tableau)
DASC 3103 Computing & Big Data
DASC 3203 Optimization Methods in Data Science
DASC 4892 Data Science Practicum I
DASC 4113 Machine Learning
DASC 4993 Data Science Practicum II

**Data Science Required Additional Courses**
MATH 2564 Calculus II (ACTS Equivalency = MATH 2505) 4 credit hours
MGMT 2053 Business Foundations 3 credit hours

Choose from one of these two-course sequences 6 credit hours
-- or --
STAT 3013 & STAT 3003 Introduction to Probability and Course STAT 3003 Statistical Methods

Data Science Concentration Courses 20-21 credit hours
General Electives 3-4 credit hours
**Total Hours** 120 credit hours

**Data Science - Accounting Analytics (ACCA) Concentration** 21 credit hours
Required Accounting Analytics Concentration Courses (18 credit hours)
ACCT 2013 Accounting Principles
ACCT 2023 Accounting Principles II
ACCT 3533 Accounting Technology
ACCT 3543 Accounting Analytics
ACCT 3543 Accounting Analytics
ISYS 4193 Business Analytics and Visualization
ISYS 4293 Business Intelligence

Elective Accounting Analytics Concentration Courses (Select 3 credit hours)
- FINN 3013 Financial Analysis
- ECON 3033 Microeconomic Theory
- ECON 4743 Introduction to Econometrics
- ECON 4753 Forecasting
- MKTG 3433 Introduction to Marketing
- MKTG 3633 Marketing Research

Data Science - Bioinformatics (BIOF) Concentration

Required Bioinformatics Concentration Courses (9 credit hours)
- BIOL 2533 Cell Biology
- BIOL 2323 General Genetics

Choose one of the following courses:
- BIOL 3863 General Ecology
- or BIOL 3023 Evolutionary Biology

Elective Bioinformatics Concentration Courses (Select 12 credit hours)
- BIOL 4174 Conservation Genetics
- BIOL 4233 Genomics and Bioinformatics
- BIOL 480V Special Topics in Biological Sciences (Molecular Phylogenetics)
- BIOL 5153 Practical Programming for Biologists
- BIOL 580V Special Topics in Biological Sciences (Meta-Analysis)
- GEOS 3543 Geospatial Applications and Information Science
- GEOS 3553 Spatial Analysis Using ArcGIS
- GEOS 3563 Geospatial Data Mining
- GEOS/ANTH 4553 Introduction to Raster GIS

Data Science - Biomedical and Healthcare Informatics (BMHI) Concentration

Required Biomedical and Healthcare Informatics Concentration Courses (11 credit hours)
- BMEG 2614 Introduction to Biomedical Engineering
- CHEM 1123 University Chemistry II (ACTS Equivalency = CHEM 1424 Lecture)
- BIOL 2213 Human Physiology (ACTS Equivalency = BIOL 2414 Lecture)
- BMEG 3801 Clinical Observations and Needs Finding

Elective Biomedical and Healthcare Informatics Concentration (Select 10 credit hours)
- BMEG 4713 Cardiovascular Physiology and Devices
- BMEG 4973 Regenerative Medicine
- BMEG 4413 Tissue Engineering
- BMEG 4403 Biomedical Microscopy
BMEG 4513 Biomedical Optics and Imaging
BMEG 4523 Biomedical Data and Image Analysis
BMEG 4983 Genome Engineering and Synthetic Biology
Note: Students completing the Biomedical and Healthcare Informatics Concentration must select CHEM 1103 and PHYS 2054 for the University Core Science Electives.

**Data Science - Business Data Analytics (BUDA) Concentration** 21 credit hours

Required Business Data Concentration Courses (15 credit hours)
- ACCT 2013 Accounting Principles
- ACCT 2023 Accounting Principles II
- WCOB 1033 Data Analysis and Interpretation
- ISYS 4193 Business Analytics and Visualization
- ISYS 4293 Business Intelligence

Elective Business Data Analytics Concentration Courses (Select 6 credit hours)
- FINN 3043 Principles of Finance
- FINN 3013 Financial Analysis
- ECON 4743 Introduction to Econometrics
- ECON 4753 Forecasting
- MKTG 3433 Introduction to Marketing
- MKTG 3633 Marketing Research

**Data Science - Computational Analytics (CMPA) Concentration** 21 credit hours

Required Computational Analytics Concentration Courses (9 credit hours)
- CSCE 3513 Software Engineering
- CSCE 4143 Data Mining
- CSCE 4613 Artificial Intelligence

Elective Computational Analytics Concentration Courses (Select 12 credit hours)
- Note: Other courses from CSCE and/or other concentrations of DASC can also be added to the concentration electives.
- CSCE 3213 Cluster Computing
- CSCE 4013 Special Topics
- CSCE 4133 Algorithms
- CSCE 4253 Concurrent Computing
- CSCE 4523 Database Management Systems
- DASC 4533 Information Retrieval (IR)
- CSCE 4853 Information Security

**Data Science - Data Science Statistics (DSST) Concentration** 21 credit hours

Required Data Science Statistics Concentration Courses (12 credit hours)
- STAT 3113 Introduction to Mathematical Statistics
- STAT 4373 Experimental Design
Elective Data Science Statistics Concentration Courses (Select 9 credit hours)
- STAT 4023 Bayesian Methods
- STAT 4033 Nonparametric Statistical Methods
- STAT 4043 Sampling Techniques
- CSCE 4613 Artificial Intelligence
- GEOS 3013 Foundations of Geospatial Data Analysis
- GEOS 3543 Geospatial Applications and Information Science
- GEOS 3563 Geospatial Data Mining

**Data Science - Geospatial Data Analytics (GSDA) Concentration**  21 credit hours

Required Geospatial Data Analytics Concentration Courses (18 credit hours)
- GEOS 3543 Geospatial Applications and Information Science
- GEOS 3553 Spatial Analysis Using ArcGIS
- GEOS 3593 Introduction to Geodatabases
- GEOS 3563 Geospatial Data Mining
- GEOS 4653 GIS Analysis and Modeling
- GEOS 4263 Geospatial Data Science - Sources and Characteristics

Elective Geospatial Data Analytics Concentration Courses (Select 3 credit hours)
- GEOS 3023 Introduction to Cartography
- GEOS 4133 Radar Remote Sensing
- GEOS 3213 Principles of Remote Sensing
- GEOS 4503 Advanced Cartographic Techniques & Production
- GEOS 4593 Introduction to Global Positioning Systems and Global Navigation Satellite Systems
- GEOS/ANTH 4553 Introduction to Raster GIS

**Data Science - Operations Analytics (OPNA) Concentration**  21 credit hours

Required Operations Analytics Concentration Courses (12 credit hours)
- INEG 2413 Engineering Economic Analysis
- INEG 3613 Introduction to Operations Research
- INEG 3623 Simulation
- INEG 4553 Production Planning and Control

Elective Operations Analytics Concentration Courses (9 credit hours)
- Select 6 credit hours from:
  - INEG 4453 Productivity Improvement
  - INEG 4543 Facility Logistics
  - INEG 4633 Transportation Logistics
  - INEG 4683 Decision Support in Industrial Engineering
  - INEG 4383 Risk Analysis for Transportation and Logistics Systems
Any SCMT course at the 2000 level or higher from the Supply Chain Analytics Concentration
Select 3 credit hours from:
INEG 4123 Global Engineering and Innovation
INEG 4433 Systems Engineering and Management
INEG 4443 Project Management

**Data Science - Social Data Analytics (SODA) Concentration**  
20 credit hours

Required Social Data Analytics Concentration Courses (14 credit hours)
SOCI 2013 General Sociology (ACTS Equivalency = SOCI 1013)
SOCI 3303 Social Data and Analysis
SOCI 3301L Social Data and Analysis Laboratory
SOCI 3313 Social Research
SOCI 4253 Social Impact of Data Analytics
SOCI 3001L Social Science Data Analytics Lab

Elective Social Data Analytics Concentration Courses (6 credit hours)
- GEOS 3013 Foundations of Geospatial Data Analysis
- GEOS 3543 Geospatial Applications and Information Science
- GEOS 3563 Geospatial Data Mining
- GEOS 4513 Introduction to GIS Programming
- GEOS 4553 Introduction to Raster GIS
- PLSC 3603 Scope and Methods of Political Science
- PLSC 4213 Campaigns and Elections
- SCWK 4073 Social Work Research and Technology I
- SOCI 4183 Social Network Analysis
- SOCI 4013 Special Topics in Sociology

**Data Science - Supply Chain Analytics (SYCA) Concentration**  
21 credit hours

Required Supply Chain Analytics Concentration Courses (18 credit hours)
SCMT 2103 Introduction to Supply Chain Management
SCMT 3613 Supply Management
SCMT 3623 Inventory and Forecasting Analytics
SCMT 3643 International Logistics
SCMT 4443 Transportation and Distribution Management
SCMT 4653 Supply Chain Strategy

Elective Supply Chain Analytics Concentration Courses (Select 3 credit hours)
- SCMT 3653 Retail Supply Chain Analysis
- SCMT 3633 Behavioral Supply Chain Management
- SCMT 4123 Sustainable Logistics and Supply Chain Management
- SCMT 4103 Special Topics in Supply Chain Management
- SCMT 4633 Transportation Analytics
- Any INEG course at the 3000 level or higher from the Operations Analytics Concentration
### B.S. Data Science (Core)

**8-Semester Suggested Plan of Study**

120 Total Credit Hours of which 21 Credit Hours are Concentration-specific Hours

Concentration-specific hours are notational for hours and when in this *suggested* Plan of Study

New courses are marked in italics

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<thead>
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**Note:** (STAT 3013 Intro. to Probability & Statistics + STAT 3003 Statistical Methods (DASC section)) can be substituted for (INEG 2313 + INEG 2333).

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<tr>
<td>0 hours General Elective</td>
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**Note:** (STAT 3013 Intro. to Probability & Statistics + STAT 3003 Statistical Methods (DASC section)) can be substituted for (INEG 2313 + INEG 2333).

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<thead>
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<tbody>
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<th>Year 4 – Spring</th>
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</thead>
<tbody>
<tr>
<td>DASC 4892</td>
<td>DASC 4993</td>
</tr>
<tr>
<td>DASC 4111</td>
<td>CCCC NNN3</td>
</tr>
<tr>
<td>DASC 4123</td>
<td>CCCC NNN3</td>
</tr>
<tr>
<td>CCCC NNN3</td>
<td>GNEL NNN3</td>
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<table>
<thead>
<tr>
<th>14 hours Total</th>
<th>12 hours Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 hours Data Science Core – Required (New + Existing Courses)</td>
<td>3 hours Data Science Core – Required (N + E Courses)</td>
</tr>
<tr>
<td>6 hours Data Science – Concentration Required + Elective</td>
<td>6 hours Data Science – Concentration Required + Elective</td>
</tr>
<tr>
<td>0 hours Gen Ed</td>
<td>6 hours Gen Ed</td>
</tr>
<tr>
<td>0 hours General Elective</td>
<td>3 hours General Elective</td>
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**Total Hours by Course Category**

<table>
<thead>
<tr>
<th>Total</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>120</td>
<td>120</td>
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</tr>
<tr>
<td>60</td>
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<tr>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: For Fall 2020, GNED 1204 is not offered, GNED 1201 is offered instead.
Appendix C
DASCBS Standard Course Evaluation
DASC – [Course Information]

Course: DASC NNNN – [Course Title]
Department: Data Science
Faculty:

The University of Arkansas provides online instructor/course evaluations for all end of course evaluations. Please note the following as you complete this online course evaluation:

1. Evaluations are located on a confidential evaluation site.
2. Your instructor will not see the evaluations until after final grades have been submitted. Your instructor's department chair and college dean will receive the composite results.
3. There is one open-ended question. If you provide a response, only the instructor will see it unless he/she decides to share responses with his/her department chair and/or college dean.
4. Your evaluations will be confidential. Your responses to scaled questions will be simply part of the composite data reported to your Instructor. Also the instructor will not be able to attribute any comments you make in the open-ended questions to you unless you write something that identifies you either directly or indirectly.
## Demographics

### UofA Student Demographics

**Your class**
- Freshman
- Sophomore
- Junior
- Senior
- Graduate
- Other

**Expected grade**
- A/PASS
- B
- C
- D
- F/FAIL

**Your College:**
- Data Science (DASC) Program
- College of Education and Health Professions
- College of Engineering
- Dale Bumpers College of Agricultural, Food and Life Sciences
- Fay Jones School of Architecture and Design
- J. William Fulbright College of Arts and Sciences
- Sam M. Walton College of Business
- School of Law
- Graduate School
- UNDECLARED

**Course required**
- Yes
- No
**DASC Core: Instructor Questions**

**Instructor Based Questions**

My instructor gives appropriate/timely feedback on each student's performance.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

My instructor is readily available for consultation.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

My instructor is fair and impartial when dealing with students.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

My instructor seems well-prepared for class.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

My instructor is effective in teaching the subject matter of this course.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree

The teaching methods used in this course enable me to learn.

- Strongly Agree
- Agree
- Undecided
- Disagree
- Strongly Disagree
# DASC: Course Based Questions

<table>
<thead>
<tr>
<th>Course Based Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content of this course is consistent with the objectives of the course.</td>
<td></td>
<td></td>
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<tr>
<td>Course activities/assignments help me learn the material.</td>
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<tr>
<td>Successful performance in this course requires that I understand the material.</td>
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</tr>
<tr>
<td>I developed a greater appreciation for this subject.</td>
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<tr>
<td>This course improves my understanding of concepts and principles in this field.</td>
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<tr>
<td>When I have a question or comment I know it will be respected.</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
I understand the course requirements and grading scale.

Strongly Agree      Agree      Undecided      Disagree      Strongly Disagree

---

**University Core Course**

**Course Based Questions**

Overall, I would rate this course as:

Excellent      Good      Fair      Poor      Very Poor

---

**University Core Instructor**

**Instructor Based Questions**

Overall, I would rate this instructor as:

Excellent      Good      Fair      Poor      Very Poor

My Instructor is fluent in English

Strongly Agree      Agree      Undecided      Disagree      Strongly Disagree
**Faculty Comment Questions**

Please use the box below to provide additional comments regarding your instructor or this course. All comments are seen only by the instructor and are not viewed by department heads, chairs or deans.

<table>
<thead>
<tr>
<th>Comments:</th>
</tr>
</thead>
</table>

Comments:
Appendix D
DASCBS Faculty
Data Science Faculty in the 2020-2021 Catalog of Studies

(The year listed at the end of each name is the year that a faculty member was started at the university.)

A

Alverson, Andrew James, Ph.D. (University of Texas at Austin), M.S. (Iowa State University), B.S. (Grand Valley State University), Assistant Professor, Department of Biological Sciences, 2012.

Aly, Mohamed H., Ph.D. (Texas A&M), M.S., B.S. (Zagazig University), Assistant Professor, Department of Geosciences, 2013.

Arnold, Mark E., Ph.D., B.S. (Northern Illinois University), A.S. (Rock Valley College), Associate Professor, Department of Mathematical Sciences, 1993.

B

Beaulieu, Jeremy M., Ph.D. (Yale University), M.S., B.S. (California Polytechnic State University), Assistant Professor, Department of Biological Sciences, 2016.

Bradley, Mindi, Ph.D., M.A. (Pennsylvania State University), B.S. (Georgia State University), Professor, Department of Sociology and Criminology, 2005.

C

Cassady, Richard, Ph.D., M.S.I.S.E., B.S.I.S.E. (Virginia Polytechnic Institute and State University), Professor, Department of Industrial Engineering, 2000.

Chakraborty, Avishek, Ph.D. (Duke University), M. STAT (Indian Statistical Institute), B. STAT (Indian Statistical Institute), Assistant Professor, Department of Mathematical Sciences, 2014.

Chaovalitwongse, Wanpracha Art, Ph.D., M.S. (University of Florida), B.Eng. (King Mongkut Institute of Technology, Ladkrabang, Thailand), Professor, Department of Industrial Engineering, 2016.

Chimka, Justin Robert, Ph.D., M.S.I.E., B.S.I.E. (University of Pittsburgh), Associate Professor, Department of Industrial Engineering, 2002.

Cothren, Jackson David, Ph.D., M.S. (The Ohio State University), B.S. (United States Air Force Academy), Professor, Department of Geosciences, 2004.
Cronan, Timothy P., Ph.D. (Louisiana Tech University), M.S. (South Dakota State University), B.S. (University of Southwestern Louisiana), Professor, Department of Information Systems, 1979.

D

Datta, Jyotishka, Ph.D. (Purdue University), M.Stat., B.Stat. (Indian Statistical Institute, Kolkata, India), Assistant Professor, Department of Mathematical Sciences, 2016.

Dennis, Norman D., Ph.D. (University of Texas at Austin), M.B.A. (Boston University), M.S.C.E., B.S.C.E. (Missouri University of Science and Technology), University Professor, Department of Civil Engineering, 1996.

Douglas, Marlis R., Ph.D., M.S., B.S. (University of Zurich), Professor, Department of Biological Sciences, 2012.

Drawve, Grant R., Ph.D. (University of Arkansas at Little Rock), M.A., B.A. (Southern Illinois University), Assistant Professor, Department of Sociology and Criminology, 2016.

Du, Yuchun, Ph.D. (Kagoshima University, Japan), B.S. (Shaanxi University of Technology, China), Associate Professor, Department of Biological Sciences, 2007.

E

Evans, Timothy A., Ph.D. (Indiana University), B.S. (Slippery Rock University), Assistant Professor, Department of Biological Sciences, 2013.

F

Forbes, Kristian M., Ph.D. (University of Jyvaskyla, Finland), Assistant Professor, Department of Biological Sciences

Freeze, Ron, Ph.D. (Arizona State University), M.B.A. (University of Missouri–Kansas City), B.S. (General Motors Institute), Clinical Associate Professor, Department of Information Systems, 2015.

Fugate, Brian, Ph.D., M.B.A., B.S. (University of Tennessee), Professor, Department of Supply Chain Management, 2015.
Gauch, Susan E., Ph.D. (University of North Carolina at Chapel Hill), M.Sc., B.Sc. (Queen’s University, Canada), Professor, Department of Computer Science and Computer Engineering, 2007.

Harris, Casey Taggart, Ph.D., M.A. (Pennsylvania State University), B.S. (Texas A&M University), Associate Professor, Department of Sociology and Criminology, 2011.

Hearne, Brittany N., Ph.D. (Vanderbilt University), Assistant Professor, Department of Sociology and Criminology, 2018

Hofer, Christian, Ph.D. (University of Maryland University College), B.A. (European School of Business), Associate Professor, Department of Supply Chain Management, 2007.

Iyer, Shilpa, Ph.D. (University of Georgia), M.Sc., B.Sc. (University of Pune, India), Assistant Professor, Department of Biological Sciences, 2016.

Jensen, Hanna Katariina, Ph.D. (University of Oulu, Finland), Research Assistant Professor, Department of Biomedical Engineering, 2015.

Kaman, Tulin, Ph.D. (Stony Brook University), M.S. (Istanbul Technical University), B.S. (Yildiz Technical University), Assistant Professor, Department of Mathematical Sciences, 2017.

Keiffer, Elizabeth, Ph.D., M.A. (University of Arkansas), B.S. (East Central University), Instructor, Department of Information Systems, 2016.

Kent, John, Ph.D. (University of Tennessee), M.B.A (University of Dallas), B.S. (Henderson State University), Department of Supply Chain Management, 2014.

Kim, Myunghee Michelle, Ph.D., B.S. (University of Texas at Austin), Clinical Assistant Professor, Department of Biomedical Engineering, 2013.
L

**Lewis, Jeffrey A.**, Ph.D. (University of Wisconsin-Madison), B.S. (University of California-Santa Barbara), Assistant Professor, Department of Biological Sciences, 2013.

**Liao, Haitao**, Ph.D., M.S., M.S.I.S.E. (Rutgers University), B.S.E.E. (Beijing Institute of Technology), Professor, Department of Industrial Engineering, 2015.

**Limp, Fred**, Ph.D., M.A., B.A. (Indiana University at Bloomington), University Professor, Department of Geosciences, 1979.

**Liu, Xiao**, Ph.D. (National University of Singapore), B.S.M.E. (Harbin Institute of Technology, China), Assistant Professor, Department of Industrial Engineering, 2017.

**Liu, Xiaqing Frank**, Ph.D. (Texas A&M University), M.S. (Southeast University, China), B.S. (National University of Defense Technology, China), Professor, Department of Computer Science and Computer Engineering, 2015.

M

**Milburn, Ashlea R.**, Ph.D. (Georgia Institute of Technology), M.S.I.E. (Virginia Polytechnic Institute and State University), B.S.I.E. (University of Arkansas), Associate Professor, Department of Industrial Engineering, 2010.

**Muldoon, Timothy J.**, M.D. (Baylor College of Medicine), Ph.D. (Rice University), B.S. (Johns Hopkins University), Assistant Professor, Department of Biomedical Engineering, 2012.


N

**Nelson, Christopher**, Ph.D. (Vanderbilt University), B.S. (University of Arkansas, Fayetteville); Assistant Professor, Department of Biomedical Engineering, 2019.

**Nolan, Steven**, [MA or MS?] (University of Arkansas), B.S. (Colorado Mesa University), 2017.

**Nurre, Sarah**, Ph.D., M.Eng., B.S. (Rensselaer Polytechnic Institute), Assistant Professor, Department of Industrial Engineering, 2015.
Park, Kiwoong, Ph.D. M.A. (Seoul National University), B.S. (Seoul National University), Assistant Professor, Department of Sociology and Criminology, 2019.

Parnell, Gregory S., Ph.D. (Stanford University), M.S. (University of Southern California), M.E.I.S.E. (University of Florida), B.S. (University of New York at Buffalo), Research Professor, Department of Industrial Engineering, 2013.

Petris, Giovanni, Ph.D., M.S. (Duke University), B.S. (Universita degli Studi di Milano, Italy), Professor, Department of Mathematical Sciences, 1999.

Pierson, Harry A., Ph.D. (The Ohio State University), M.S.E.M., B.S.M.E. (University of Missouri, Rolla), Assistant Professor, Department of Industrial Engineering, 2014.

Pohl, Edward A., Ph.D., M.S.R.E. (University of Arizona), M.S.E. (Air Force Institute of Technology), M.S.E.M. (University of Dayton), B.S.E.E. (Boston University), Professor, Department of Industrial Engineering, 2004.

Pohl, Letitia, Ph.D. (University of Arkansas), M.S.S.E. (Air Force Institute of Technology), B.S.M.E. (Tulane University), Clinical Assistant Professor, Department of Industrial Engineering, 2013.

Quinn, Kyle P., Ph.D. (University of Pennsylvania), B.S. (University of Wisconsin), Assistant Professor, Department of Biomedical Engineering, 2014.

Rainwater, Chase E., Ph.D. (University of Florida), B.S.I.E. (University of Arkansas), Associate Professor, Department of Industrial Engineering, 2009.

Rao, Raj R., Ph.D. (University of Georgia), M.S. (University of Texas), M.Sc., B.E. (Birla Institute of Technology and Sciences, India), Professor, Department of Biomedical Engineering, 2016.

Robinson, Samantha
Rhoads, Douglas Duane, Ph.D. (Kansas State University), M.A., B.A. (Wichita State University), University Professor, Department of Biological Sciences, 1990.

Rossetti, Manuel D., Ph.D., P.E., M.S.I.S. (The Ohio State University), B.S.I.E. (University of Cincinnati), Professor, Department of Industrial Engineering, 1999.
Rossiter-Hofer, Adriana, Ph.D. (University of Maryland-College Park), M.S. (Federal University of Rio de Janeiro, Brazil), B.S. (Federal University of Pernambuco, Brazil), Associate Professor, Department of Supply Chain Management, 2008.

S

Schubert, Karl D., Ph.D. (University of Arkansas), M.S. (University of Kentucky), B.S. (University of Arkansas), Professor, Office of the Dean College of Engineering, 2018.

Shook, Carole, M.S.B.A., B.S.B.A. (University of Arkansas), Instructor, Department of Supply Chain Management, 1999.

Siepielski, Adam M., Ph.D. (University of Wyoming-Laramie), M.S. (New Mexico State University), B.S. (Pennsylvania State University-University Park), Assistant Professor, Department of Biological Sciences, 2015.

Song, Young Hye, Ph.D. (Cornell University), M.S. (Cornell University), B.S. (Carnegie Mellon University), Assistant Professor, Department of Biomedical Engineering, 2019.

Sullivan, Kelly M., Ph.D. (University of Florida), M.S.I.E., B.S.I.E. (University of Arkansas), Assistant Professor, Department of Industrial Engineering, 2012.

Syler, Rhonda A., Ph.D. (Auburn University), M.B.A. (Columbus State University), M.S. (Kansas State University), B.S. (Middle Tennessee State University), Clinical Assistant Professor, Department of Information Systems, 2016.

T

Thomas, Rodney W., Ph.D., M.B.A. (University of Tennessee), B.S.B.A. (Greensboro College), Associate Professor, Department of Supply Chain Management, 2017.

Thomas, Stephanie, Ph.D. (Georgia Southern University), M.B.A (University of Tennessee), B.A. (University of Tennessee), Clinical Assistant Professor, Department of Supply Chain Management, 2017.

Tipton, John Robert, Ph.D. (Colorado State University), M.S. (Colorado State University), B.S. (Colorado State University), Assistant Professor, Department of Mathematical Sciences, 2017.

Tullis, Jason A., Ph.D., M.S. (University of South Carolina at Columbia), B.S. (Brigham Young University), Professor, Department of Geosciences, 2004.
Van Hoek, Remko, Ph.D. (University of Utrecht), M.B.A. (London School of Economics), B.S.B.A. (Vanderbilt University), Clinical Full Professor, Department of Supply Chain Management, 2018.

W

Williams, Jr., Donnie F., Ph.D. (Georgia Southern University), Clinical Assistant Professor, Department of Supply Chain Management, 2019

Wu, Xintao, Ph.D. (George Mason University), M.E. (Chinese Academy of Space Technology), B.S. (University of Science and Technology), Professor, Department of Computer Science and Computer Engineering, 2014.

Y

Yang, Song, Ph.D., M.S. (University of Minnesota-Twin Cities), M.A. (Nankai University, China), B.A. (Branch College of Nankai, China), Professor, Department of Sociology and Criminology, 2002.

Z

Zhang, Qingyang, Ph.D. (Northwestern University), M.S. (Loyola University–Chicago), B.S. (Beijing Normal University), Assistant Professor, Department of Mathematical Sciences, 2015.

Zhang, Shengfan, Ph.D., M.I.E. (North Carolina State University), B.M. (Fudan University, Shanghai), Assistant Professor, Department of Industrial Engineering, 2011.