State of Data Science Education Opportunities in Nevada

Nevada Chapter of the American Statistical Association
State of Data Science and Annual Meeting
3 October 2020

All speaker presentation materials from this session are compiled here, and shared on behalf of these programs by NV-ASA. In the future, other related programs will be invited to present and share their materials here.
Programs presenting:

• Mathematics and Data Science (Nevada State College)
• Mathematics and Statistics (University of Nevada Reno)
• Mathematical Sciences (University of Nevada Las Vegas)
• Educational Psychology & Higher Education (University of Nevada Las Vegas)
• Biostatistics (University of Nevada Reno)
• Epidemiology & Biostatistics (University of Nevada Las Vegas)
• College of Business (University of Nevada Reno)
• Lee School of Business (University of Nevada Las Vegas)
Data Science at Nevada State College

October 3, 2020
Recent Developments
Recent Developments

1. Program approval
   - B.A. in Data Science
   - B.S. in Data Science
Recent Developments

1. Program approval
   • B.A. in Data Science
   • B.S. in Data Science

2. Internal Growth
Recent Developments

1. Program approval
   • B.A. in Data Science
   • B.S. in Data Science

2. Internal Growth
Future growth areas
Future growth areas

1. Search for an assistant professor
Future growth areas

1. Search for an assistant professor
2. Increased partnerships with local businesses and organizations
Thank you!
Excited? We are too!
For further information contact:

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Nevada State College
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702-992-2743
UNR Dept of Mathematics and Statistics
MS and PhD in Statistics and Data Science

Anna Panorska
University of Nevada Reno
Department of Mathematics and Statistics
Statistics and Data Science Programs

Anna K. Panorska

State of Data Science Event
Nevada Chapter of the American Statistical Association
October 3, 2020
Programs summary

Undergraduate: BS or BA in Mathematics with Statistics specialization

Graduate: MS (start F2019) and PHD (start S2017) in Statistics and Data Science (circa 30 students now, 50/50 MS and PHD)

PHD Program Objectives/Student learning Outcomes:
• Development of computational skills to solve applied problems involving data.
• Attainment of deep understanding of the theory of statistics and data science and the ability to do independent research as demonstrated through a Ph.D. dissertation.
• Development of communication skills to effectively explain, both orally and in writing, the results of applied and theoretical work.
• Development of skills needed to work as a private consultant and/or as part of a team.
Success stories

- Emily – honors student at UNR, first job at Amazon, quick progression up.
- Michael - undergrad, working on Wall Street.
- Andrew - MS 2011, was the Assistant Director of the Statistic and Methods Core of the California Center for Population Research at UCLA; now Statistician at Harvard Medical School
- Dillon - MS in 2017, Now PhD student in Statistics U of Arizona
- Karla - MS 2019, Math Instructor at TMCC
- Suresh - MS in 2007; Sr. Software Engineer/Team Lead, Reno tech company.
- Erick – MS in 2010, now lead Data Scientist at Disney, Inc. now our PhD student.
- Fares – MS in 2008, PhD Stats UNM, now lead Biostatistician, Division of Public Health, Department of Family and Preventive Medicine, University of Utah, Salt Lake City, UT
- Ryan - MS in 2015, first job on Wall Street, now leads a group of data Scientists for a large Medical group in NYC.
US News 100 BEST JOBS:

**Statistician Overview**
- Overall Score 7.5 / 10
- #1 in Best Business Jobs
- #6 in 100 Best Jobs
- #6 in Best STEM Jobs
- **MEDIAN SALARY:** $87,780
- UNEMPLOYMENT RATE: 2.8%
- NUMBER OF JOBS: 13,600

- **Fastest growing jobs:** Statistician #9
- Projected job growth: 33%
- Median salary: $91,160

CareerCast: BEST Jobs 2019

1. **Data Scientist**
   - Overall Rating: 97
   - Median Salary: $114,520
   - Projected Growth: 19.00%

2. **Statistician**
   - Overall Rating: 110
   - Median Salary: $84,760
   - Projected Growth: 33.00%

10. **Actuary:**
    - Overall Rating: 141
    - Median Salary: $101,560
    - Projected Growth: 22.00%
Thank you!

Remember to always carry a healthy dose of common sense in your pocket and keep data science-ing ... and ... smiling!
UNLV Mathematical Sciences
M.S. and Ph.D. in Statistics

Zhijian Wu
State of Data Science Education in Nevada

Zhijian Wu
Department of Mathematical Sciences, UNLV

October 3, 2020
Industry Trends

• 1.5 Million Managers Needed
• 876,000 Analytics Professionals Needed
• $111,267 Median Salary for Data Scientists
• CareerCast.com ranked data scientists fifth in its list of Best Jobs of 2017
• 15.75% growth projected for jobs in the industry
• 1. Data Scientist  
  Median Salary: $114,520, Projected Growth: 19.00%

• 2. Statistician  
  Median Salary: $84,760, Projected Growth: 33.00%

• 3. ....
Data Related Programs in DMS
Master of Science - Mathematical Sciences
Applied Statistics - Thesis Track

• Total Credits Required: 33
• Course Requirements
• REQUIRED COURSES – CREDITS: 6
  • MAT 657 - Introduction to Real Analysis I
  • MAT 663 - Advanced Matrix Theory and Applications
• CORE COURSES – CREDITS: 12
  • STA 761 - Regression Analysis I
  • STA 762 - Regression Analysis II
  • STA 767 - Mathematical Statistics I
  • STA 768 - Mathematical Statistics II
• STATISTICS COURSES – CREDITS: 6
  • Complete an additional 6 credits of 700-level STA coursework in a field of special interest to the student.
• ELECTIVE COURSES – CREDITS: 3
  • Complete 3 credits of 600- or 700-level MAT or STA courses (excluding MAT 711 & 712), or other advisor-approved courses.
• THESIS – CREDITS: 6
  • STA 791 - Thesis
Data Related Programs in DMS

Applied Statistics - Comprehensive Exam Track

- Total Credits Required: 30
- Course Requirements
- REQUIRED COURSES – CREDITS: 6
  - MAT 657 - Introduction to Real Analysis I
  - MAT 663 - Advanced Matrix Theory and Applications
- CORE COURSES – CREDITS: 12
  - STA 761 - Regression Analysis I
  - STA 762 - Regression Analysis II
  - STA 767 - Mathematical Statistics I
  - STA 768 - Mathematical Statistics II
- STATISTICS COURSES – CREDITS: 6
  - Complete an additional 6 credits of 700-level STA coursework in a field of special interest to the student.
- ELECTIVE COURSES – CREDITS: 6
  - Complete 6 credits of 600- or 700-level MAT or STA courses (excluding MAT 711 & 712), or other advisor-approved courses.
Enrollments in Statistics Programs (Fall 2020)

- Fall 2020 MS Statistics Graduate Students = 9
- Fall 2020 PhD Statistics Graduate Students = 14
- Fall 2020 Undergraduate Math Majors = 217
- Fall 2020 Undergraduate Math Minors = 119
UNLV Educational Psychology and Higher Education
Ph.D. in Educational Psychology, Assessment and Quantitative Analysis in Education track
Daniel Wright
Assessment & Quantitative Analysis in Education
AQUA in ED

PhD stream in Educational Psychology – MSc going through committees and a certificate applied for.

Selection of quantitative courses, research methods, plus cognition/education courses. Work on communicating with policy makers and other stakeholders.

Research topics: psychometrics, response times in assessments, educational statistics (e.g., using tests scores to rate teachers), learning analytics, etc.

Employment: Education sector (federal, state, district), testing and Ed Tech companies, research companies (lots of Ed research at Rand, AIR, WestEd, etc), and academia (e.g., teaching stats in education, psychology, and social science departments).
UNR Community Health Sciences, Epidemiology, Biostatistics, and Environmental Health Division
M.S. in Biostatistics
Matthew Strickland
Biostatistics M.S. degree at UNR

Matthew Strickland, PhD MPH
Associate Professor / Division Lead
Epidemiology, Biostatistics, and Environmental Health
School of Community Health Sciences
University of Nevada, Reno
mstrickland@unr.edu
UNR’s M.S. program in biostatistics is ideal for students who want to learn to conduct quantitative analysis in medicine, public health, and biology.

High demand for biostatisticians:

- Government: Census Bureau, FDA, CDC
- Pharmaceutical and biotech: Pfizer, Eli Lilly, Amgen
- Medical institutes: Renown, Cleveland Clinic, Mayo Clinic
- Private industries: Microsoft, Google, Facebook
Four ways biostatistics differs from statistics and data science

1. Focus on health and disease, and on the statistical methods commonly used in health research
   - Some examples of faculty expertise: traumatic injury, infectious disease, biomarker discovery
   - Survival analysis, longitudinal data analysis, categorical data analysis
Four ways biostatistics differs from statistics and data science

2. Causal inference (rather than prediction) is often the goal
   • Vitally important for public health, medicine, and policy
   • The language and concepts of causal inference – DAGs, positivity, exchangeability, consistency, counterfactuals, etc.
Four ways biostatistics differs from statistics and data science

3. Health information systems
   • Build, use, and maintain health information systems
   • Health database management skills using SAS, which is the most commonly used statistical programming language in many health agencies
Four ways biostatistics differs from statistics and data science

4. Statistical consulting with health professionals
   • Provide statistical consultation to medical doctors, nurses, public health scientists, and biologists under the supervision of biostatistics faculty
More information

UNR’s M.S. degree in biostatistics is a fully-accredited, 36 credit hour program

https://www.unr.edu/public-health/academics/ms-biostatistics

• Regular fall admission
• Calculus 1 and 2 are required

Dr. Kristen Clements-Nolle, Director of Graduate Studies
clements@unr.edu
UNLV Public Health
M.P.H. and Ph.D. in
Epidemiology and Biostatistics

Chad Cross
Biostatistics
UNLV School of Public Health

CHAD CROSS, PHD, PSTAT®
Introduction - SPH

The UNLV School of Public Health (SPH) was established in Fall 2004
Founding Dean: Dr. Mary Guinan (2004-2013)
Current Dean: Dr. Shawn Gerstenberger (2013- )

The mission of the School of Public Health (SPH) is to advance the science of public health, improve the health and quality of life of people in our communities, and work to eliminate health disparities in Nevada, the nation, and the world by providing leadership in quality education, research, and service.

The School of Public Health at UNLV is the first and only accredited School of Public Health in Nevada, and it is one of only 66 in the world with this distinction by the Council on Education for Public Health (CEPH).
Introduction - EAB

The Epidemiology & Biostatistics (EAB) Unit was established in Spring 2005

- EAB was initially under the Department of Environmental & Occupational Health
- Director: Dr. Chad Cross (2005-2011)

EAB officially became a department on 01 July 2020

- Director: Dr. Sheniz Moonie (2011-2019)
- Chair: Dr. Sheniz Moonie (2020- )

Degrees offered

- MPH (Biostatistics & Epidemiology; also professional tracks)
- PhD (Public Health – Epidemiology & Biostatistics Track)
Objectives

At a minimum, the following criteria should be met to assure each student

- Develops an understanding of the areas of knowledge that are basic to public health
- Acquires skills and experience in the application of basic public health concepts and of specialty knowledge to the solution of community health problems
- Demonstrates integration of knowledge through a capstone experience

We have an implicit requirement that our students in EAB get “hands on” experience in:

- Multiple programs (SAS, R, SPSS, some scripting)
- Experience with complex data sets
- “Real World” problems
Course Requirements

EAB MPH Course Requirements
- EAB 700 (Research Methods)
- EAB 703 (Biostatistics)
- EAB 715/725 (Chronic/Infectious Disease Epidemiology)
- EAB 763 (Linear Models)

EAB PhD Course Requirements
- EAB 791 (Intermediate Biostatistics)

Electives
- EAB 730 (Statistical Computing with SAS)
- EAB 733 (Survey Sampling)
- EAB 743 (Experimental Design)
- EAB 753 (Nonparametric Statistics)
- EAB 770 (Categorical Data Analysis)
- EAB 773 (Survival Analysis)
- EAB 783 (Multivariate Statistics)
- EAB 788 (Meta-Analysis)
Professions/Industries/Titles

Common Industries for our Graduates
- Academia
- Local and State Health Division
- Federal Government
- Specialty consulting
- Hospital and other health data companies

Common Titles
- Biostatistician
- Statistician
- Epidemiologist
- Population Health Analyst
- Data Analyst
- Health Data Analyst
UNR College of Business
M.S. Business Analytics

Kal Joshi
Why choose the University of Nevada, Reno for your Online MSBA?

- Flexible scheduling with **100% online coursework**
- A small student-to-faculty ratio
- AACSB accredited College of Business

- Learn at your convenience with **3 start dates per year**
- **STEM designation** conferred by the U.S. Dept. of Homeland Security
- Study with an **R1 Carnegie Classification research institution**
Brief Program Overview

• The University of Nevada, Reno Online Master of Science in Business Analytics (MSBA) is a STEM-designated degree program.

• It provides enhanced depth of knowledge for students who actively seek market driven Data Analytics tools and techniques and, data driven critical thinking, communications, teamwork and leadership skills that enhance career readiness.

• The 30-credit MSBA degree program features a challenging and impactful market driven curriculum base that introduces you to the complexities of data driven organizational decision-making, with an emphasis on real-world application. Predictive Modeling, Applied Data Science, AI, Deep insights from Big Data sets.

• Coursework highlights the role that actionable data and purposeful strategy both play in helping businesses make data driven, insightful decisions.

• Guided by expert faculty leadership, the Online MSBA Program can help you harness the power of Big Data to drive smarter business and managerial decisions, and create strategic value.
## MSBA Curriculum

<table>
<thead>
<tr>
<th>Course Listing</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BAN 701  Business Analysis Methods</td>
<td>3</td>
</tr>
<tr>
<td>BAN 702  Data Transformation and SQL</td>
<td>3</td>
</tr>
<tr>
<td>BAN 703  Information Visualization &amp; Communication</td>
<td>3</td>
</tr>
<tr>
<td>BAN 704  Applied Data Science</td>
<td>3</td>
</tr>
<tr>
<td>BAN 705  Enterprise Processes &amp; Analytics</td>
<td>3</td>
</tr>
<tr>
<td>BAN 706  Predictive Modeling &amp; Data Mining</td>
<td>3</td>
</tr>
<tr>
<td>BAN 707  Big Data</td>
<td>3</td>
</tr>
<tr>
<td>BAN 708  Data Security, Risk Management, &amp; Ethics</td>
<td>3</td>
</tr>
<tr>
<td>BAN 709  Leadership Strategies</td>
<td>3</td>
</tr>
<tr>
<td>BAN 710  Business Analytics Project</td>
<td>3</td>
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</tbody>
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No Cost Skills Bootcamp

An inclusive transition program.

Although students with a strong technical understanding of computer science often choose a career in data analytics, many successful programmers have also come from artistic, creative and other backgrounds. For this reason, we have developed a focused and dedicated entry point to guide and nurture our nontraditional students as they quickly get up to speed.

Incoming students are required to obtain the necessary competencies through our non-credit Bootcamp. This Bootcamp consists of three weeks of self-paced exercises, and includes a foundational understanding of open-source programming languages that includes R and Python.

The Bootcamp allows students from diverse educational backgrounds — or those with previous coursework — to position themselves for success not only in the program, but also in the growing field of business analytics.
Admission requirements:

To be eligible for admission into the online Master of Science in Business Analytics program, you must meet the following requirements:

- Bachelor’s degree from a regionally accredited institution
- Minimum 2.75 GPA in the last two years of undergraduate study
- Proficiency in word processing and the general ability to use computers to analyze and solve business problems using software such as spreadsheets, statistical packages and databases
- English language proficiency

In addition, please include the following documents with your application:

- A 1-page personal statement
- Two letters of recommendation
- Curriculum Vitae or resume

Prerequisite courses*:

- Undergraduate course in Statistics
- Introduction to Information Systems (which includes MS Office and Excel)

*Note: All students who are admitted to the MSBA Program are required to successfully complete the pre-program, self paced, non-credit, free of cost MSBA Skills Bootcamp.
The faculty have designed this program with a comprehensive approach to issues in big data industry. From day one, emphasis has been placed on priming an analytical perspective and developing the hard skills to implement analytics. The faculty have demonstrated an adaptive mindset to address our particular class needs on a week to week basis.

The instructors at UNR have a tremendous amount of industry experience. The depth of their insight and practical knowledge have cultivated an engaging learning environment. I have appreciated their accessibility and their promptness to address any concerns and questions. Our professors show a passion to be problem solvers and to develop problem solvers, which translates into sincere commitment to the success of the students.

Build relationships with your peers in the program. They are a great support system and bring their unique experiences to enrich discussions. Share helpful resources.

The hard skills of programming in R and understanding SQL queries will definitely be beneficial in any future position. Research I conducted for coursework will be valuable to my company.
Student Success Stories

**MSBA Student Review | Josh Rodriguez | University of Nevada, Reno**

The faculty and professors are the best in their class. The professors are motivated to ensure that you fully understand the subject matter, while also being a mentor to guide your objectives while you undertake the coursework. Having professors with decades or professional experience, in addition to being top researchers, give you unique access to a resource you would not find through other online programs.

I’m a senior data analyst for a marketing analytics technology company. The MSBA online degree program has a direct impact on my work, and I’ve already been able to apply coursework to my job. Although early in the program, I expected that many of the courses would have an immediate impact on my current career and influence me in areas that I have yet to consider. I’m also excited to build a professional portfolio of projects and research that I can showcase to potential employers.

Being in the program has led to positive conversations with my manager, which has allowed me to communicate the direction I’d like to take my career. I’ve also received messages from recruiters on LinkedIn, expressing interest in my graduate studies and how that experience will qualify me for certain positions.
Further MSBA Program Details:

https://onlinedegrees.unr.edu/msba

MSBA Director: Kal N. Joshi - knj@unr.edu
UNLV Lee School of Business
M.S. Applied Economics and Data Intelligence
M.S. & Graduate Certificate, Management Information Systems
M.S. & Graduate Certificate, Data Analytics

Michael Lee
ANALYTICS PROGRAMS AT LEE BUSINESS SCHOOL
Undergraduate Programs
- One business analytics course as part of the required curriculum for all business majors and one elective course in Advanced Business Analytics
- Undergraduate minor in Data Analytics

Graduate Programs
- M.S. in Applied Economics and Data Intelligence
  - [https://www.unlv.edu/degree/ms-data-analytics-applied-economics](https://www.unlv.edu/degree/ms-data-analytics-applied-economics)
- M.S. in Management Information Systems
  - [https://www.unlv.edu/degree/ms-management-information-systems](https://www.unlv.edu/degree/ms-management-information-systems)
- Graduate Certificate in Management Information Systems
  - [https://www.unlv.edu/certificate/management-information-systems](https://www.unlv.edu/certificate/management-information-systems)
<table>
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<th>M.S. Management Information Systems</th>
<th>M.S. Applied Economics abd Data Intelligence</th>
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<td>2019</td>
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</tr>
<tr>
<td>2020</td>
<td>85</td>
<td>18</td>
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- **New Program**
  - M.S. Cybersecurity (Interdisciplinary)
  - One course in Security Analytics
  - [https://www.unlv.edu/degree/ms-cybersecurity](https://www.unlv.edu/degree/ms-cybersecurity)

- **Approved Program**
  - Graduate Certificate in Data Analytics
  - Four graduate courses in Data Management and Analytics

- **Proposed Program**
  - M.S. Data Analytics (Interdisciplinary)
  - Lee Business School, Hughes College of Engineering, College of Sciences, School of Community Health Sciences, William F. Harrah College of Hospitality
- Most analytics programs are housed in the Department of Management, Entrepreneurship and Technology

- **Department Chair**
  - Dr. Rajiv Kishore (rajiv.kishore@unlv.edu)

- **Director of Graduate Technology Programs**
  - Dr. Han-fen Hu (han-fen.hu@unlv.edu)

- **Director of Interdisciplinary Cybersecurity Program**
  - Dr. Greg Moody (gregory.moody@unlv.edu)

- **Instructor for Graduate Analytics Courses**
  - Dr. Michael J Lee (michael.j.lee@unlv.edu)