Statistics and Analytics (STAN)

Mark Arnold
Program Director
301 Science Engineering Building
479-575-3351
Email: arnold@uark.edu

Statistics and Analytics Website
(https://statistics-analytics.uark.edu/)

Degree Conferred:
M.S. (STANMS)

Program Description: The Graduate Certificate and M.S. degree in Statistics and Analytics are cross-college interdisciplinary programs that build on the university's current strengths in the Colleges of Arts and Sciences; Business; Education and Health Professions; and Engineering. Students may choose one of six concentrations: Statistics; Biological Analytics; Business Analytics; Operations Analytics; Computational Analytics; Educational Statistics & Psychometrics; or Quantitative Social Sciences.

Primary Areas of Faculty Research: Statistics and statistical analysis and design methodologies in business analytics, operations analytics, computational analytics, educational statistics and social science research.

Admission to the Master's Program: In addition to the requirements of the Graduate School, applicants for admission to the M.S. program in Statistics and Analytics must submit a) three letters of recommendation from persons familiar with the applicant's previous academic and professional performance and b) official test scores as specified for the applicant's area of interest.

M.S. in Statistics and Analytics with Concentration in Biological Analytics

Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext).

Requirements for Concentration in Biological Analytics

Undergraduate Deficiencies
MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)
MATH 30803 Linear Algebra

Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

Required Courses
CSCE 50103 Advanced Special Topics in Computer Science or Computer Engineering (taken as introduction to cluster computing)
BIOL 51573 Practical Programming for Biologists

ISYS 57203 Advanced Multivariate Analysis 3
Choose from one of the following options:
9 additional hours of electives
3 hours of electives, 6 hours of thesis credit, and submission of an acceptable thesis
Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours 30

Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext).

Requirements for Concentration in Business Analytics

Undergraduate Deficiencies
MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)

Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

Required Courses
ISYS 51003 Data Analytics Fundamentals 3
ISYS 58303 Data Management Systems 3
ISYS 58403 Seminar in Business Intelligence and Knowledge Management 3

Choose one of the following options:
9 hours of electives
3 hours of electives and 6 hours of thesis credit and submission of an acceptable thesis.

Written comprehensive exam (non-thesis) or defense of the thesis.

Total Hours 30

Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreestext).

Requirements for a Concentration in Computational Analytics

Undergraduate Deficiencies
MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)
MATH 30803 Linear Algebra
CSCE 41303 Algorithms

Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design.

Required Courses
CSCE 55203 Database Management Systems 3

Two of the following:

6
### Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreetext).

### Requirements for a Concentration in Quantitative Social Science

#### Undergraduate Deficiencies
- MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)
- MATH 30803 Linear Algebra
- STAT 30133 Introduction to Probability

#### Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

#### Required Courses
- ISYS 57203 Advanced Multivariate Analysis
- ECON 57503 Forecasting
- ECON 66203 Econometrics II
- ECON 66303 Econometrics III

Choose one of the following options:

- 6 hours of electives to include two of the following: cost benefit analysis; GIS and spatial analysis; multilevel modeling; social network analysis

- 6 hours of thesis credit and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours: 30

### Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreetext).

### Requirements for Concentration in Educational Statistics and Psychometrics

#### Undergraduate Deficiencies
- MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)
- MATH 30803 Linear Algebra

#### Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

#### Required Courses
- ESRM 50103 Research Methods in Education
- ESRM 66503 Measurement and Evaluation
- ESRM 67503 Item Response Theory

Choose one of the following options:

- 9 hours of electives as approved by the student's advisory committee

- 3 hours of electives, 6 hours of thesis credit, and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours: 30

### Requirements for Concentration in Operations Analytics

#### Undergraduate Deficiencies
- MATH 24004 Calculus I (ACTS Equivalency = MATH 2405)
- MATH 30803 Linear Algebra
- STAT 30133 Introduction to Probability

#### Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

#### Required Courses
- INEG 56103 Introduction to Optimization Theory
- INEG 58003 Simulation
- ISYS 58403 Seminar in Business Intelligence and Knowledge Management
- CSCE 50703 Data Mining

Choose one of the following options:

- 9 hours of electives

- 3 hours of electives, 6 hours of thesis credit and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours: 30

### Requirements for Concentration in Statistics

#### Undergraduate Deficiencies
- MATH 25004 Calculus II
- MATH 30803 Linear Algebra

#### Core
Requirements include one course from each of these areas as approved by the student's advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

#### Required Courses
- INEG 56103 Introduction to Optimization Theory
- INEG 58003 Simulation

One of the following:

- ISYS 58403 Seminar in Business Intelligence and Knowledge Management
- CSCE 50703 Data Mining

Choose one of the following options:

- 9 hours of electives

- 3 hours of electives, 6 hours of thesis credit and submission of an acceptable thesis

Written comprehensive exam (non-thesis) or defense of the thesis

Total Hours: 30

### Requirements for the Master of Science (M.S.) Degree
Requirements for the master's degree are fulfilled through one of seven concentrations. Students should also be aware of Graduate School requirements with regard to master's degrees (http://catalog.uark.edu/graduatecatalog/degreerequirements/#mastersdegreetext).
Core
Requirements include one course from each of these areas as approved by the student’s advisory committee: Statistical Methods, Regression Analysis, Multivariate Analysis, Experimental Design

Required Courses
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT 51033</td>
<td>Introduction to Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>STAT 51133</td>
<td>Statistical Inference</td>
<td>3</td>
</tr>
<tr>
<td>STAT 53333</td>
<td>Analysis of Categorical Responses</td>
<td>3</td>
</tr>
<tr>
<td>STAT 54433</td>
<td>Computational Statistics</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose one of the following options:

- 6 hours of electives
- 6 hours of thesis credit and submission of acceptable thesis

Written comprehensive exam (non-thesis) or defense of thesis

Total Hours: 30

Graduate Faculty

Aloysius, John, Ph.D. (Temple University), B.S. (University of Colombo, Sri Lanka), Professor, J.B. Hunt Transport Department of Supply Chain Management, Oren Harris Chair in Logistics, 1995, 2017.

Arnold, Mark E., Ph.D., B.S. (Northern Illinois University), A.S. (Rock Valley College), Associate Professor, Department of Mathematical Sciences, 1993, 1999.

Beaulieu, Jeremy M., Ph.D. (Yale University), M.S., B.S. (California Polytechnic State University), Associate Professor, Department of Biological Sciences, 2016, 2021.

Bridges, Ana Julia, Ph.D. (University of Rhode Island), M.S. (Illinois State University), B.S. (University of Illinois-Urbana-Champaign), Professor, Department of Psychological Science, 2007, 2019.

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, 2019.

Chakraborty, Avishek, Ph.D (Duke University), M.S., B.S. (Indian Statistical Institute), Associate Professor, Department of Mathematical Sciences, 2014, 2020.

Chimka, Justin Robert, Ph.D., M.S.I.E., B.S.I.E. (University of Pittsburgh), Associate Professor, Department of Industrial Engineering, 2002, 2009.

Cothren, Jackson David, Ph.D., M.S. (The Ohio State University), B.S. (United States Air Force Academy), Professor, Department of Geosciences, Leica Geosystems Chair in Geospatial Imaging, 2004, 2017.

Covington, Matthew D., Ph.D. (University of California-Santa Cruz), B.A. (University of Arkansas), Associate Professor, Department of Geosciences, 2012, 2018.

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, M.D. Matthews Endowed Chair in Information Systems, 1979.

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

Douglas, Michael Edward, Ph.D. (University of Georgia), M.S., B.S. (University of Louisville), Professor, Department of Biological Sciences, 21st Century Chair in Global Change Biology, 2011.

Feng, Song, Ph.D., M.S. (Chinese Academy of Sciences), B.S. (Yunnan University), Associate Professor, Department of Geosciences, 2013, 2018.


Fitzpatrick, Kevin M., Ph.D. (State University of New York at Albany), M.A. (University of South Carolina at Columbia), B.A. (Susquehanna University), University Professor, Department of Sociology and Criminology, Bernice Jones Chair in Community, 2005, 2014.

Freeze, Ron, Ph.D. (Arizona State University), M.B.A. (University of Missouri–Kansas City), B.S. (General Motors Institute), Clinical Professor, Department of Information Systems, 2015, 2021.

Gaduh, Arya, Ph.D. (University of Southern California), M.Phil. (Cambridge University), B.A. (University of California-Berkeley), Associate Professor, Department of Economics, 2013, 2019.

Gauch, Susan E., Ph.D. (University of North Carolina at Chapel Hill), B.Sc., B.Sc. (Queen’s University, Canada), Professor, Department of Electrical Engineering and Computer Science, 2007.

Gu, Jingping, Ph.D. (Texas A&M University), M.A. (Peking University), B.A. (Renmin University of China, Beijing), Associate Professor, Department of Economics, 2008, 2014.

Harris, Casey Taggart, Ph.D., M.A. (Pennsylvania State University), B.S. (Texas A&M University), Professor, Department of Sociology and Criminology, 2011, 2023.

Johnson, Jon, Ph.D. (Indiana University at Bloomington), M.B.A., B.S. (University of Arkansas), Professor, Department of Strategic Entrepreneurship and Venture Innovation, Walton College Professorship in Sustainability, 1996, 2007.

Levine, William H., Ph.D., M.S. (State University of New York at Binghamton), B.S. (DePaul University), Associate Professor, Department of Psychological Science, 2001, 2007.

Lo, Wen-Juo, Ph.D., M.A. (Arizona State University), B.S. (SooChow University), Associate Professor, Department of Rehabilitation, Human Resource and Communication Disorders, 2008, 2014.

Mitchell, Joshua Lee, Ph.D. (Southern Illinois University), M.P.A., B.S. (Murray State University), Associate Professor, Department of Political Science, 2010, 2019.

Mullins, Jeff, Ph.D., M.A., B.S. (University of Arkansas), Assistant Professor, Department of Information Systems, 2006, 2018.

Naithani, Kusum, B.S. (University of Agriculture and Technology-India), B.Sc. (University of Lucknow-India), Associate Professor, Department of Biological Sciences, 2014, 2021.

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), Professor of Practice, 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, 2016.


Rainwater, Chase E., Ph.D. (University of Florida), B.S.I.E. (University of Arkansas), Professor, Department of Industrial Engineering, 2009, 2021.

Rossetti, Manuel D., Ph.D., P.E., M.S.I.E. (The Ohio State University), B.S.I.E. (University of Cincinnati), University Professor, Department of Industrial Engineering, 1999, 2022.

Song, Geoboo, Ph.D. (University of Oklahoma), B.A. (Korea University), B.A. (Hanyang University), Associate Professor, Department of Political Science, 2012, 2019.
Stenken, Julie A., Ph.D. (University of Kansas), B.S. (University of Akron), Professor, Department of Chemistry and Biochemistry, 21st Century Chair of Proteomics, 2007.
Sykes, Tracy Ann, Ph.D. (University of Arkansas), B.S. (University of Maryland-College Park), Associate Professor, Department of Information Systems, 2011, 2016.
Turner, Ronna L., Ph.D. (University of Illinois-Urbana-Champaign), M.S.E. (Missouri State University), B.S.E. (Southwest Missouri State University), Professor, Department of Curriculum and Instruction, 1997, 2018.
Wu, Xintao, Ph.D. (George Mason University), M.E. (Chinese Academy of Space Technology), B.S. (University of Science and Technology of China), Professor, Department of Electrical Engineering and Computer Science, Charles D. Morgan/Acxiom Graduate Research Chair, 2014, 2019.
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, 2016.
Zhang, Qingyang, Ph.D. (Northwestern University), M.S. (Loyola University-Chicago), B.S. (Beijing Normal University), Associate Professor, Department of Mathematical Sciences, 2015, 2021.
Zhang, Shengfan, Ph.D., M.I.E. (North Carolina State University), B.M. (Fudan University, Shanghai), Associate Professor, Department of Industrial Engineering, John L. Imhoff Chair in Industrial Engineering, 2011, 2020.