# DATA ANALYTICS - MASTER OF DATA ANALYTICS

Data analytics is an inherently interdisciplinary discipline, dealing with methods and systems to synthesize knowledge or insights from large quantities of data collected from heterogeneous sources and diverse spatial and time scales. Data analytics employs theories, methodologies, and tools drawn from many fields, within the broad areas of mathematics, statistics, and computer and information sciences, and applies them to a diversity of data-rich domains, such as life sciences, medicine, physical sciences, social sciences, engineering, business, and education.

The PMS in Data Analytics will provide students with a strong foundation in data management and analysis, the computational and statistical thinking, and understanding of computer systems. After completing this program, students will have gained the skills and ability to:

- Analyze real-life data from diverse sources and domains
- Effectively apply analytics tools to large data sets
- Apply mathematical and statistical models to data analysis problems
- Apply computational thinking to develop effective data analytics solutions
- Apply programming and debugging skills to problem solving
- Understand and use computer technology and software in solving real-life data analysis problems
- Understand and address unfamiliar problems related to data analytics
- Develop effective instrument to communicate solutions to diverse audiences

## Program

The professional focus of the degree will prepare students for success in the workplace, with an emphasis on enriching the preparation of students who are already in the workplace and are seeking technical skills to advance their careers in the data analytics domain.

## Program Features

- Degree granted from New Mexico State University
- Asynchronous courses delivery to accommodate student schedules & needs
- 30 credits [3 semesters and a summer, 9 credits/semester; students may enroll part time]
- In person courses are permissible
- Industry experience encouraged

## Affiliated Faculty (Non-Computer Science Faculty)

- Laura Boucheron, PhD, University of California Santa Barbara; Image processing, machine learning and deep learning applied to image analysis, interdisciplinary applications including astronomy and biomedical; Klipsch School of Electrical & Computer Engineering
- Hansuk Sohn, PhD, University of Iowa; Mathematical Programming (Linear, Integer, and Stochastic) and Dynamic Programming, Algorithm development (Optimization, Heuristic, and Hybrid algorithms), Statistical Data Analysis and Data Mining; Industrial Engineering

- Charlotte Gard, PhD, University of Washington; Biostatistics; Department of Economics, Applied Statistics, and International Business
- Clint Loest, PhD, Kansas State University; Ruminant Nutrition, Animal Nutrition; Animal and Range Sciences
- Carlo A. Mora-Monge, PhD, The University of Toledo; Business Analytics, Supply Chain Analytics, E-commerce Use; Management Department
- Marshall A. Taylor, PhD, University of Notre Dame; Computational Social Science, Cultural Sociology, Cognitive Sociology; Department of Sociology

## Curriculum

The curriculum for the degree program is composed of 30 graduate credits.

| Prefix | Title | Credits |
|---|---|---|
| **Foundation** | | |
| C S 453 | Python Programming I | 3 |
| or C S 454 | Python Programming II | |
| A ST 511 | Statistical Methods for Data Analytics | 3 |
| Select one of the following courses | | 3 |
| C S 458 | R Programming I | |
| A ST 515 | Statistical Analysis with R | |
| **Methodologies** | | |
| C S 508 | Introduction to Data Mining | 3 |
| C S 519 | Applied Machine Learning I | 3 |
| or E E 565 | Machine Learning I | |
| Select one of the following courses | | 3 |
| C S 502 | Database Management Systems I | |
| BCIS 575 | Database Management Systems | |
| ICT 458 | Web Development and Database Applications | |
| **Advanced Topics and Applications** | | |
| Choose nine credits from the following: | | 9 |
| A ST 555 | Applied Multivariate Analysis | |
| A ST 616 | Computational Statistics | |
| ASTR 630 | Advanced Methods in Astrophysics | |
| BIOL 566 | Advanced Bioinformatics and NCBI Database | |
| BCIS 566 | Business Analytics II | |
| C S 509 | Bioinformatics Programming | |
| C S 516 | Bioinformatics | |
| C S 506 | Computer Graphics I | |
| or ICT 460 | Advanced Software Development Concepts | |
| C S 582 | Database Management Systems II | |
| E E 596 | Digital Image Processing | |
| ENGL 543 | Multimedia Theory and Production | |
| or COMM 550 | Seminar in Communication Technologies | |
| I E 545 | Characterizing Time-Dependent Engineering Data | |
| or BCIS 561 | Business Analytics I | |
| I E 515 | Stochastic Processes Modeling | |
| or I E 522 | Queuing Systems | |
| I E 567 | Design and Implementation of Discrete-Event Simulation | |
| MATH 5220 | Fourier Series and Boundary Value Problems | |
| or STAT 5230 | Elementary Stochastic Processes | |
| SOCI 5150 | Seminar in Social Networks | |

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| SOCI 5155 | Seminar in Text Analysis for the Social Sciences | |
| SOCI 5160 | Seminar in Data Visualization | |
| **Capstone Experience** | | |
| Select one of the following courses | | 3 |
| C S 598 | Master's Project | |
| MATH 5999 | Master's Thesis | |
| A ST 598 | Special Research Problems | |
| E E 598 | Master's Technical Report | |
| I E 599 | Master's Thesis | |
| Internship | | |
| **Total Credits** | | **30** |