# MS Data Analytics Worksheet

The M.S. in Data Analytics equips students with technical skills that are used by professional data scientists for data analysis, visualization, predictions, and discoveries. The program covers applications in many industries and specialties such as health care, hospitality, social sciences, engineering, business, and government.

**Suggested Course Plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Fall—Year One** | **Spring—Year One** | **Fall—Year Two** | **Spring—Year Two** |
| DA 621 | DA 622 | DA 651 | DA 790 |
| MIS 761 | MIS 769 | MIS 776 | Electives |
| STA 691 | STA 692 | Electives | Electives |

**Required Courses—27 Credits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course #** | **Course Title** | **Description** | **Credits** |
| DA 621 | Programming for Data Analytics I | Program design, coding, debugging, and documentation using techniques of good programming style in the Python  programming language. Students will learn programming with the goal of eventually being able to use popular machine learning libraries that are used extensively in the field of data analytics as whole. | 3 |
| DA 622 | Programming for Data Analytics II | This course provides a broad introduction to techniques used in data analytics by building on the foundations given in DA 621. Topics include supervised learning such as linear regression, binary classification, support vector machines, neural  networks, deep learning, and unsupervised learning such as clustering and dimensionality reduction.  The course focuses on the practical application of these tools and discusses recent applications of data analytics with a focus on business, health, bioinformatics, OCR, text and web data processing. | 3 |
| DA 651 | Managing Big Data and Web Databases | This course will teach the concepts and techniques of databases for real-time web and big data applications. The course will focus primarily on NoSQL, object oriented, and XML databases.  Topics include characteristics and significance of NoSQL databases, NoSQL data formats, key and value pairs, basic schema in NoSQL, and table structures and data types. | 3 |
| DA 790 |  | The course will provide the student with an understanding of core concepts in data analytics by building a specific application. The goal is to utilize the various methodologies and techniques to identify a data set upon which students can design a scheme, store the data, run experiments, and communicate their findings. | 3 |
| STA 691 | Statistics for Scientists I | Frequency distributions, descriptive statistics, elementary probability; Bernoulli, binomial, and normal distributions; statistical sampling, estimation, and hypothesis testing. | 3 |
| STA 692 | Statistics for Scientists II | Chi-square tests for goodness-of-fit and independence, simple and multiple linear regression, designing an experiment (analysis of variance), multiple comparisons. | 3 |
| MIS 761 | Business Analytics Methods and Tools | Explores how data analytics relates to the scientific method, and then employs advanced statistical techniques for the contemporary analysis of organizational data. Taking an analytical approach, the applicability of particular statistical approaches/packages for gaining a business understanding in specific settings will be examined. | 3 |
| MIS 769 | Big Data Analytics for Business | Focuses on big data analytics concepts, tools and methods within the business environment. Explores big data principles and information technology innovation in organizations. Includes multiple tools and statistical concepts related to the contemporary analysis of big data. | 6 |
| MIS 776 | Business Intelligence | Business intelligence refers to the set of technologies and tools that enable organizations to integrate, store, analyze, and report data for the purpose of obtaining competitive advantage. Students will be exposed to key components of business intelligence applications, including defining data structure, analyzing cubes, data mining, and reporting. |  |

Note: STA 691 and STA 692 can be replaced with a sequence of discipline specific statistical courses. These include (HOA 730, HOA 732), (EAB 780, EAB 783), and any other graduate level sequence of statistical courses.

**Electives—9 Credits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Courses** | **Course Title** | **Description** | **Credits** |
| Advisor Approved | In Specific Discipline | Students will take three courses in a specific topic to prepare them for the final culminating experience class DA 790. These electives may be in hospitality, liberal arts, sciences, engineering, business, or health. | 9 |