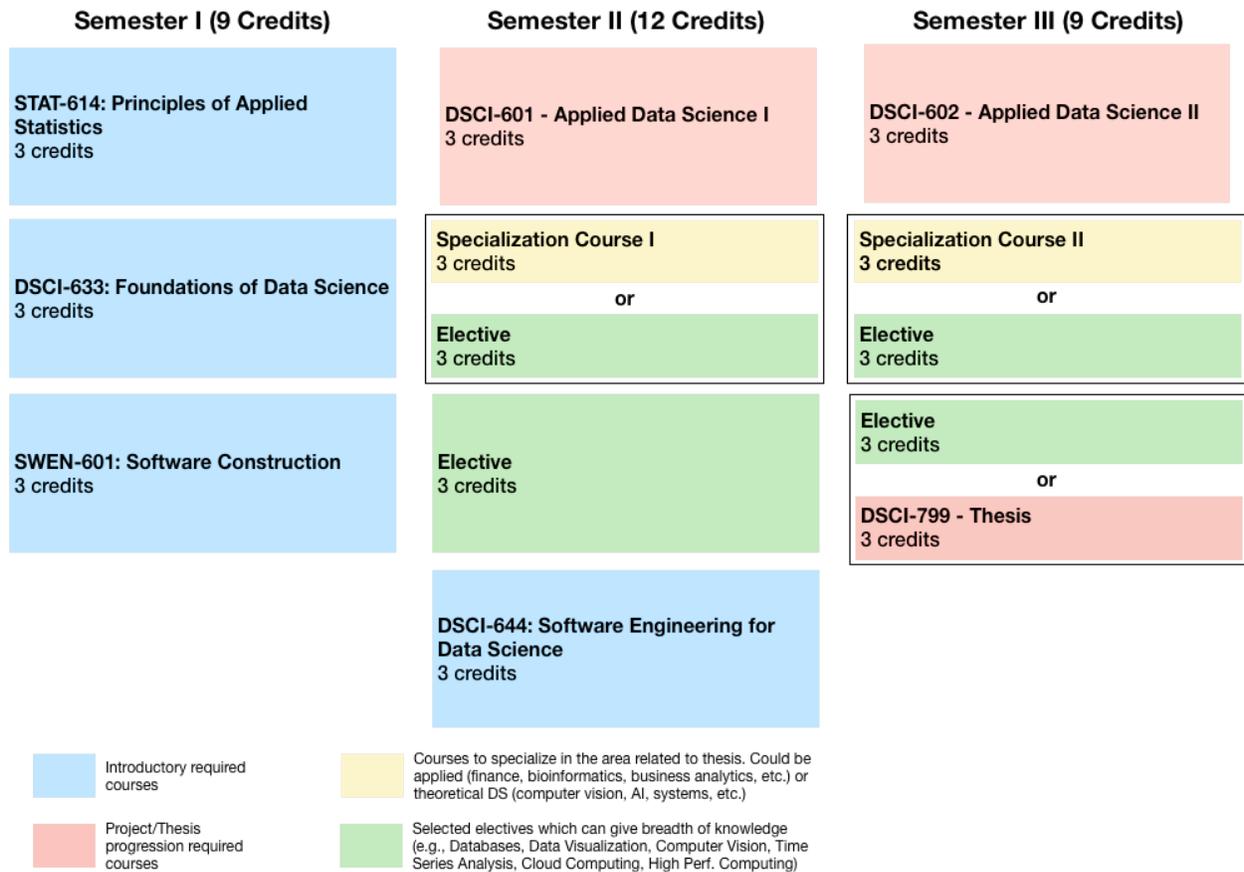


RIT On Campus Masters in Data Science Curriculum



Masters in Data Science On Campus Curriculum

The on campus masters in data science (MSDS) curriculum has been designed to provide you with the foundational knowledge and skills you need to be an effective data scientists, while at the same time being introduced to the broad range of applied domains which you can work within as a data scientist. The curriculum is also designed to provide you with the software engineering expertise you will need to building efficient, robust, maintainable and sustainable data science software systems for industry scale use at today's top corporations.

Foundational Coursework

The MSDS designed things so that you can complete the majority of your required coursework in the first semester, with an additional required course in the second semester (the blue courses). These courses (SWEN-601, STAT-614, DSCI-633 and DSCI-644) will provide all the foundational knowledge you need for the rest of the program.

We also understand that many future data scientists may not have a strong programming background or come from a computing related field, the SWEN-601: Software Construction has been designed which will prepare you for the degree's programming requirements as well as give you the skills you need to be successful in technical interviews with programming components.

Applied Data Science Project Sequence

On campus students will participate in a required applied data science course sequence in which you'll develop your own data science project (Applied Data Science I and II) under guidance by an external company or internal RIT faculty sponsor, along with a data science faculty advisor. This sequence begins after completing your first semester of foundational coursework. In the second and third semesters of the program you'll be able to design and implement your project under supervision of your advisor(s) and sponsor(s).

By participating in this course you'll progress along with the other masters students in your cohort, seeing how core data science algorithms and skills can be applied to a broad range of applied data science domains. You'll have the opportunity to showcase and demonstrate your project to other students and faculty, as well potential future employers.

Masters Thesis and Capstone Tracks

Before your last semester you can select to either do a masters thesis for 3 credits, or instead take an additional elective and graduate with your applied data science project as a capstone. The applied data science project sequence is designed so that if you're excited and enjoyed your project you can expand on it into a masters thesis in this last semester.

Cooperative Education & Experiential Education Component (Co-op)

You will have the option of completing up to a maximum of 12 months of work experience through RIT's co-op program. You will have with many opportunities to meet with potential employers through events and services provided by RIT's Office of Cooperative Education & Experimental Education.

Specializations

Given the wide range of domains in which data scientists can be employed, the curriculum provides flexibility for you to specialize in a particular sub area. This is done by taking two courses as a specialization sequence. These could be courses in an applied field like business analytics, bioinformatics, remote sensing, marketing, etc, or more domain specific, such as computer vision, big data or machine learning. Potential courses/areas for a specialization include:

Bioinformatics:

- ISTE-772 Knowledge Discovery for Biomedical Informatics • BIOL-630 Bioinformatics Algorithms
- BIOL-650 High Throughput Sequence Analysis

Business Analytics:

- BANA-680 Data Management for Business Analytics
- BANA-780 Advanced Business Analytics

Color Science:

- CLRS-600 Fundamentals of Color Science

- CLRS-601-Principles of Color Science
- CLRS-720 Computational Vision Science

Healthcare/Medicine:

- CISC-864 Medical Imaging and Image Informatics: Principles and Algorithms
- MEDI-701 Intro to Health Informatics
- MEDI-735 Healthcare Systems

Image Science:

- IMGS-632 Advanced Environmental Applications of Remote Sensing
- IMGS-723 Remote Sensing: Spectral Image Analysis

Speech and Language Processing:

- ENGL-681 Introduction to Natural Language Processing
- ENGL-684 Spoken Language Processing

Remote Sensing:

- IMGS-613 Probability, Noise and System Modeling
- IMGS-616 Fourier Methods for Imaging
- IMGS-682 Image Processing and Computer Vision
- IMGS-711 Computational Methods for Imaging Science
- IMGS-754 Pattern Recognition
- IMGS-756 Advanced Digital Image Processing

Marketing:

- MKTG-768 Marketing Analytics
- MKTG-773 Database Marketing
- MKTG-668 Pay-Per Click Marketing

Management Information Systems:

- MGIS-650 Introduction to Data Analytics and Business Intelligence • MGIS-710 Information Systems Concepts
- MGIS-720 Information Systems Design
- MGIS-725 Data Management and Analytics
- MGIS-735 Design and Information Systems

Signal Processing:

- EEEE-602 Random Signals and Noise
- EEEE-678 Digital Signal Processing
- EEEE-768 Adaptive Signal Processing

Statistics/Time Series Forecasting:

- STAT-741 Regression Analysis
- STAT-745 Predictive Analytics
- STAT-747 Principles of Statistical Data Mining
- STAT-773 Time Series Analysis and Forecasting

Electives

The following electives are pre-approved for the MSDS:

- DSCI-650 High Performance Data Science

- DSCI-789 Neural Networks for Data Science
- SWEN-610 Foundations of Software Engineering
- SWEN-614 Engineering Cloud Software Systems
- SWEN-745 Software Modeling
- SWEN-789 Engineering Self Adaptive Systems
- ISTE-724 Data Warehousing
- ISTE-740 GIS
- ISTE-780 Data Driven Knowledge Discovery
- ISTE-782 Visual Analytics
- CISC-849 Advanced Computer Vision
- CISC-863 Statistical Machine Learning
- MATH-605 Stochastic Processes
- MATH-695 Statistical Methods for Bioinformatics
- MATH-711 Advanced Methods in Scientific Computing
- MATH-761 Mathematical Biology
- STAT-701 Foundations of Experimental Design
- STAT-745 Predictive Analytics
- STAT-756 Multivariate Analysis
- STAT-773 Time Series Data Prediction

The Golisano College of Computing and Information Sciences also provides a large number of potential elective courses from varying computing disciplines which you can take with approval from the graduate director.

