Eastern University
Graduate Data Science and Analytics

Program Handbook

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Introduction

Welcome

Welcome to Eastern University's graduate data science and analytics programs!

In our data-driven and technological age, individuals with a robust understanding of data science are more valuable than ever. These programs are designed for students with all levels of experience, equipping you for a wide variety of interesting and in-demand careers. It is our goal that you will gain specific, marketable skills in the top coding languages, along with critical knowledge in DS-standard programming, mathematics, statistics, data analysis, and machine learning.

Handbook Purpose

This handbook provides general information for students or prospective students in the Master's in Data Science/Data Analytics and post-baccalaureate certificate programs. It includes important university and program policies along with some of the more frequently asked questions about the programs. We ask that students familiarize themselves with the content in this handbook.

Program Overview

Master's of Science in Data Science

The Master's of Science in Data Science is a 30 credit program (3 credit hours per course). Our self-paced format allows students to complete their coursework at a pace that works for you while making progress toward a master's degree. Within each 7-week period, you can complete your coursework as quickly as you'd like. And while students can work at their own pace within the term, classes can only be taken during regularly scheduled terms even if a class is finished early.

In the program you will learn: Python, R, SQL, statistical theory, database design, visualization techniques, programs including Amazon Web Services (AWS) and Tableau, machine learning, ethical considerations of Data Science topics along with numerous 3rd party programming packages such as Numpy, Pandas, Scikit-learn, and Tensorflow.

Eastern provides you with all of the resources needed to complete your education at your pace. The program ensures that graduates will have a broad range of skill sets that are needed to be competitive in the job market. Graduates will enter the workforce with the statistical theory, coding, database management, visualization, and machine learning background to be able to analyze and solve analytical problems in their industry.

Master's of Science in Data Analytics

Eastern University's 100% online Master of Science in Data Analytics empowers students for success in the rapidly growing data-driven industries through flexible, self-paced learning. Learn how to drive business growth and innovation by leveraging insights derived from decisions anchored in data. You will learn highly in-demand skills for data professionals through mastery of R, SQL, Tableau, Python, and more.

The MSDA was born out of our MS in Data Science program, which has helped thousands of students learn skills necessary to improve their career trajectories. Our instructors have used evidence-based approaches to refine course materials to ensure an excellent educational experience.

Graduates emerge equipped with essential skills in statistics, predictive analytics, data visualization, and more, positioning them to excel in data analytics careers or make a successful transition into the field.

Certificate in Data Science / Certificate in Data Analytics

These certificates are designed for all students, whether you are a newcomer to data science and analytics or you are an experienced professional. Through our certificate programs you will learn essential Python, R, Tableau, and SQL skills depending on the specific certificate. All courses in the 12-credit certificate count directly towards the Master's in Data Science or Master's in Data Analytics, and those who complete either certificate program will be accepted into either of those programs.

Faculty & Staff Contacts

General Program Contact
datascience@eastern.edu

General Student Advising Contact
dsadvising@eastern.edu

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Other Important Campus Contacts

Registrar (course registration)
registrar@eastern.edu
- Please contact your academic advisor *first* concerning registration questions.
- You DO NOT need advisor approval to sign up for courses.
- Students can take a maximum of two classes per term.

Student Accounts (billing)
 student.accounts@eastern.edu

Financial Aid
 finaid@eastern.edu

Document Statements

The material in this handbook is accurate as of the last revision date to the extent of our knowledge. Please take the time to look through the official Graduate catalog for more detailed policies and procedures. Note that this handbook supersedes any information contained in the Graduate catalog. Eastern reserves the right to change its policies, regulations, courses of study, and schedule of fees without previous notice.

Admissions

Who is this degree for?

Our program is a fit for all types of learners. Learn to code from scratch, with any level of experience. If you've never coded before, or if you're an expert, Eastern's self-paced design is perfect for whatever background you have.

When can I enroll?

Enrollment is ongoing and students can start in one of six terms: Fall1, Fall2, Spring 1, Spring 2, Summer 1, and Summer 2. View the current academic calendar for more information and the dates of each term.

Admissions Requirements

Visit our webpage for the most up-to-date admission requirements.

Change of Degree or Certificate Program

- **Certificate Program to Full Degree**: Students who successfully complete the certificate program and decide to continue with the full degree can apply and have all four courses count towards their full degree.
- **Full Degree to Certificate Program**: For current students who would like to change to the certificate program, they must withdraw from the full degree program and apply through Admissions to the certificate program. Students should contact their advisor (dsadvising@eastern.edu) for assistance.

- ○ Please note that if you are already enrolled in a full degree program, pursuing a certificate may impact your financial aid package. Check with your advisor or the Financial Aid Office for further information.

Tuition & Financing

Tuition & Fees

Visit our website for the most up-to-date tuition and fee information.

Financial Aid

Visit the Financial Aid Office's web page for federal and state financial aid options that may be available to you, as well as military benefits.

There are also a limited number of Graduate Assistant positions available for exemplary students who not only demonstrate strong, documented excellence in course content, but also show a commitment to assisting other students in a compassionate, patient, and respectful manner. In exchange for the commitment to GAing one course, the GA will receive a tuition waiver for one of their courses. GAs can only GA one course at a time.

Academic Policies

Incompletes and Extension of Due Dates

The only way to complete work after the end of term due date is through an incomplete (https://catalog.eastern.edu/graduate/academics/).

Incompletes (1) are for when a "student fails to complete course requirements because of extreme and unforeseen circumstances that may have affected academic performance", and (2) "must be approved by the professor teaching the course." Any request for additional time to complete assignments must satisfy the conditions set forth in the catalog (link above), and unless there are extenuating circumstances, must be approved by the instructor before the end of the term. Students should note that this is exceedingly rare, and truly requires "extreme and unforeseen extenuating circumstances."

Qualification for Incomplete

In addition to the above stated "extreme and unforeseen extenuating circumstances" qualification, in order to further qualify for an incomplete, students must have completed at least 75% of graded items in the course (exams, assignments, quizzes, etc.). For assignments with

multiple/unlimited submissions, a passing grade must be earned on a graded item to be considered as complete.

Repeat Requests

Requests for an Incomplete grade should be reserved for "extreme" and "unforeseen" circumstances. Because of this, students should note that granting of a request is exceedingly rare.

Students may be granted a maximum of two Incompletes during the program. Students will not be allowed to take an Incomplete in back-to-back terms. Students should give careful thought when registering for a course after a term when an Incomplete has been granted. Given the extra time needed to complete the Incomplete work, they should consider if they will have enough time to finish a new course.

Students with documented disabilities that have the potential to contribute to an unforeseen or extreme circumstance that may lead to needing an Incomplete are encouraged to contact the Disability Office of CCAS for information on how to request formal accommodations. MSDS will work on a case by case basis with students with approved academic accommodations who are in need of an Incomplete.

Process

1. The student should be in touch with their academic advisor as soon as possible if circumstances arise where there might be a need for an extension, even if they do not currently think they will need an extension. Last minute requests will be considered but there should be an urgent reason why the incomplete request wasn't requested earlier.

2. In the rare case that an extension is needed, the student should contact their academic advisor and provide details along with any possible documentation. Last minute requests will be considered but there should be an urgent reason why the incomplete request wasn't requested earlier. Requests submitted after the term will only be allowed if the advisor and/or instructor have sufficient reason to believe there was a truly extenuating or unexpected circumstance, such as a hospitalization that occurred during the final days or weekend of the term. If the request is after the term, documentation must be provided before moving to subsequent steps.

3. The academic advisor will verify all qualifications are met and forward the request to the instructor for final approval or denial.

Academic Integrity

It is our expectation that the work you do as a part of Eastern University will demonstrate honest and ethical behavior. The primary rule to ensure academic integrity is that all submitted work must be your own.

To ensure academic integrity, you may not view another student's work before you turn your work in, and you may not provide your work to someone who has not already submitted their assignment. Collaboration between students is only permitted if you are asking for clarification on a topic or assignment instruction. Collaboration on quizzes and exams is not permitted.

Do's and Don'ts include, but are not limited to:

Do
- Give credit to others for their work both for written assignments and coding assignments
- You are allowed to use a few lines of code from online sources only if you both give credit to the source and where it is not the solution to an assignment
- Assist other students with a topic or to help the other student to understand the instructions for an assignment
- Reach out to other students on the discussion board to ask a clarifying question (without showing your code)
- Reach out to your course Graduate Assistant or Instructor for clarification or assistance
- Ensure that you give yourself enough time to work on assignments. There is much more pressure to look up answers if there is an upcoming deadline.
- Search sites such as Stackoverflow for help with specific error messages

Don't
- Post solutions to assignments or exam questions online where others could search and view them
- Post assignments, portions of assignments, or exam questions online asking for solutions to assignments or using online solutions
- Pass someone else's written communication or code off as your own
- Show or make available to other students your code if they have not already submitted their assignment
- Work collaboratively on an assignment, such as splitting up the work and combining it prior to submission -- The bottom line is that ALL work must be your own.
- View another student's code or search online for solutions before submitting your assignment
- Fabricate results, data, or statistics
- Share or discuss specific exam questions publicly or with other students (discussing with the course instructor and GA is appropriate)
- Submit work that you have used in a previous course or previously submitted to another university program (especially for your capstone project)

The student is responsible to become familiar with acceptable standards for research and documentation and to abide by them. If students are unsure whether something is appropriate, please discuss with an appropriate staff member beforehand. All codegrade submissions are subject to audit, and credit may be deducted if assignments are not created per the instructions provided.

AI and Large Language Model (LLM) Use

In our MS in Data Science and Data Analytics programs, students are encouraged to utilize AI and Large Language Models (LLMs) ethically to support their learning. Students may use LLMs for general coding assistance, understanding theoretical concepts, debugging, and studying. **However, using LLMs to complete assignments, assessments, or to generate specific solutions for graded work is strictly prohibited.** Plagiarism through LLMs is also not allowed. Violations of this policy can result in severe disciplinary actions, including a failing grade or dismissal from the program. For any uncertainties about acceptable use, students should consult their instructor or program staff.

Do:
   - Make use of AI-based tools from third-party providers (like ChatGPT, GitHub Copilot, the new Bing, etc.) to assist in studying for an exam or helping to understand a concept more deeply.

Don't:
   - Make use of AI-based tools from third-party providers (like ChatGPT, GitHub Copilot, the new Bing, etc.) to assist in generating answers or writing code

Please see [the Acceptable Use of AI and LLMs Student Policy here](#) for further information.

Penalties for Academic Dishonesty

Academic Penalty – In the event that an incident of academic dishonesty occurs in violation of policy, the the instructor may do one of the following things, according to his/her assessment of the severity of the infraction:
   - Assign a grade of F or "0%" on the paper, project or examination but allow resubmission, resulting in a maximum combined grade of C.
   - Assign a grade of F or "0%" on the paper, project or examination without the opportunity for resubmission.
   - Assign a grade of F in the course. Students who receive a grade of F in the course who opt to repeat the course to earn a passing grade will receive no higher than a C- upon completion of the repeat.

The definition of academic dishonesty may be determined by the program handbook and additional definitions the instructor has published to his/her students in the syllabus.

In all cases the instructor will forward evidence of dishonesty to the program director. The program director, in consultation with program staff and instructor, will make a recommendation of disciplinary action to the Dean of the College.

All cases of academic dishonesty will be reviewed by the Dean of the College for possible disciplinary action. Any disciplinary action will occur in addition to the academic penalty. Disciplinary penalties may include disciplinary probation, suspension or disciplinary dismissal.

Academic Integrity Issues Found in Later Terms

If academic integrity issues are found at a later time after the term ends and grades have been finalized and submitted to the Registrar's Office, then a full letter grade will be deducted for the respective course.

Grade Appeals Policy

The Grade Appeals Policy applies only to questions of faculty evaluation of student performance. Since evaluation involves issues of judgment, action to revise a grade in the student's favor will not be recommended unless there is clear evidence that the original grade was based on prejudiced or capricious judgment or that it was inconsistent with official policy. For grade appeals, the steps in the following link must be fully completed: [Grade appeals policy](#)

Student Disability Policy

Notice to students with Physical or Learning Disabilities: In order to be entitled to disability accommodations at Eastern University, students must submit a written request to the Cushing Center for Counseling and Academic Support (CCAS) and be found eligible for accommodations. In order to make an accommodation for this course, the professor must receive a written request from CCAS. Disability accommodations are not retroactive and will not be implemented until a request from CCAS is received. All accommodations must be reactivated by the student prior to the beginning of each new academic session. For further information, please go to the following site: [Disability Accommodations](#)

Class Attendance Policy

Courses are asynchronous and online, which means you will not have a formal time to meet. Therefore, you will not be required to attend class. From time to time, we will check and see who has been active and who has not. If we email you about this, please know we're just trying to look out for you.

Copies of Course Assignments

Students are responsible for retaining a copy(ies) of all materials submitted for grading. If a paper or project is misplaced or lost in transition, the student must provide a substitute copy upon request.

Students are also responsible for backing up their work as they go along. Loss of information while working on an assignment, such as having computer problems where your file is lost, is

not grounds to receive an extension to a due date. We strongly encourage students to keep all files on their EU Google Drive. You can learn about how to conveniently do this [through this link](#).

Emergency and Crisis Information

In the case of an emergency event and you are on campus, we ask that all community members use their best judgment. We also recommend that each member of this community become familiar with emergency procedures. Call Eastern's Public Safety department at 610-341-1737 for emergencies on the St. Davids campus or building security or call local police at other locations.

It is expected that you keep up with your email, as instructions will come any time the university closes.

Statement of Diversity, Equity and Belonging

Eastern University is a teaching and learning community that seeks, as a priority of the Christian faith, to engage and understand the full range of diverse human perspectives and experiences. To that end, we invite people with diverse backgrounds in terms of race, ethnicity, age, nationality, religion, culture, disability, socioeconomic status, sex, gender, and other unique identities to join and enjoy the benefits of our faith-based community.

Statement of Mandated Reporting/Title IX

Eastern University is committed to providing a community in which all of its members feel safe and respected. To this end, please be aware that all teaching faculty of Eastern University are mandatory reporters. Should you disclose or they observe sexual assault, sexual harassment, interpersonal violence, or stalking, or some other form of abuse, they are required to report this to Eastern University's Title IX Coordinator. Reports of sexual misconduct or criminal behavior can be reported via this link: www.eastern.edu/form/report-sexual-misconduct. For additional information, please contact Eastern University's Title IX Coordinator by emailing titleix@eastern.edu.

Course Repeat Policy

Students may repeat a maximum of two classes during the program. Repeats include:
1. Required repeats of classes for which a failing grade was received during the first attempt (below a C-), or for which a grade of "W" was received during the first attempt;
2. Optional repeats of classes for which a passing grade of B-, C, C+, or C- was received, but for which the student would prefer a higher grade.

In all cases, the higher grade obtained upon repeating the class will replace the failing grade, "W" grade, or previous passing grade, in the calculation of the student's cumulative GPA, but all grades earned will remain on the student's transcript.

Students are allowed a total of two failing grades/"W" grades before facing academic consequences, up to and including academic dismissal from the program. This situation can arise in two distinct ways:
   1. Failure of, or withdrawal from, the same class twice;
   2. Failure of, or withdrawal from, two distinct classes.

In order to move forward in the program under either of the above circumstances, an "Exception to Policy" must be requested and approved by all relevant departments. To obtain information about this process, please reach out to your Academic Advisor. See the Catalog for additional information on dismissal.

Academic Warning, Probation, and Dismissal

Academic Warning

Upon earning one F or one W in a required class, students will receive an academic warning from the Program Director and Advising Team. This should not be considered disciplinary, but instead as an attempt to assure students understand their academic standing before being placed on probation. Depending on circumstances, some students may be placed on probation without having received an academic warning.

Probation

Students who have fewer than 12 credits will be placed on probation if their GPA is under 2.75, while students who have 12 or more credits will be placed on probation if their GPA is under 3.0. Students who are on probation may only take one class per term until they return to satisfactory academic standing.

Students will have either two courses (6 credits) or 180 days, whichever comes first, to raise their GPA above the threshold. Once the GPA returns over the limit, students will be taken off probation. Students can be placed on probation multiple times if their GPA warrants.

In addition, the MSDS department has the option to place students on probation for other circumstances, regardless of their cumulative GPA, such as academic integrity violations, cases where a retake of a required course will need an ETP due to the course repeat policy and the student otherwise has a good academic record, multiple withdrawals from either a single course or multiple courses, and other instances at the discretion of the program staff.

Students in the above probation scenarios can be removed from probation by either correcting the initial issue (example: retaking and passing a required course) or at the discretion of program staff.

Dismissal

Students can be dismissed from the MSDS program for any of the following:
- Three total F's in the program, including those where GPA is replaced by additional attempt(s)
- Two F's in a single required course (see course repeat policy)
- One F and one W in a single required course (see course repeat policy)
- Failure to improve GPA in allotted time/credits following probation

Additionally, the Dean has the option to require immediate withdrawal regardless of prior academic performance when there is little or no likelihood of success following two or more failing grades.

Student Conduct Policy

Eastern University's [Student Conduct, Policies, and Procedures](#) applies to all students at Eastern University, and you should familiarize yourself with them. In addition to these policies, the MSDS explicitly forbids:

- Intimidation, harassment, or bullying
- Disrespectful communication towards a fellow student, Faculty, or Staff Member
- Maltreatment on the basis of any protected class membership
- Racial and ethnic intimidation and harassment
- Verbal abuse, including offensive, profane, and vulgar language
- Behavior that could reasonably be seen to cause the disruption or obstruction of the learning process
- Other egregious conduct as determined by the Dean of the College of Health and Sciences

Upon minor violations of the conduct policy, students will be issued a written warning from the Program Director. After a second violation, or egregious first violation, students can be dismissed from the MSDS program.

Academics

Program & Course Length

The Master's of Science in Data Science (MSDS) and the Master's of Science in Data Analytics (MSDA) are 30 credit programs (3 credit hours per course). Certificate programs are 12 credits

(3 credit hours per course). Students have the option to take one or two courses per term. We strongly suggest that you take one course your first term until you get a feel of the course load. Each course is seven weeks in duration and is scheduled six times a year (Spring 1, Spring 2, Summer 1, Summer 2, Fall 1, Fall 2). See the Program of Study Schedules section for more information on the suggested order of classes.

Introductory Courses

It is our recommendation that students in the MSDS, MSDA, and the Certificate in Data Science programs start with DTSC 520: Fundamentals of Data Science (see course description below). This course introduces many foundational concepts and prepares students for future classes.

For those students in the Certificate in Data Analytics program or for those looking to take two courses their first term, the second suggested course is DTSC 550: Introduction to Statistical Modeling. This course introduces students to the core theories and techniques of statistical analysis for data science.

For students who have experience in the field, there is an option to start the program outside of the introductory courses.

Curriculum

All students in the MSDS and MSDA programs must complete four core (required) classes along with six additional elective courses. The Certificate programs must complete all four of their required classes. The respective curriculum for each program is listed below.

MSDS

Course Number	Course Title	Credits
Required		
DTSC 650	Data Analytics in R	3
DTSC 660	Data and Database Management with SQL	3
DTSC 670	Foundations of Machine Learning Models	3
DTSC 690	Philosophical and Ethical Issues in Data Science	3
Electives		
DTSC 520	Fundamentals of Data Science	3
DTSC 550	Introduction to Statistical Modeling	3
DTSC 560	Data Science for Business	3
DTSC 575	Principles of Python Programming	3
DTSC 580	Data Manipulation	3
DTSC 600	Information Visualization	3
DTSC 620	Cloud Foundations	3

Course Number	Course Title	Credits
DTSC 680	Applied Machine Learning	3
DTSC 685	Natural Language Processing	3
DTSC 691	Applied Data Science	3

MSDA

Course Number	Course Title	Credits
Required		
DTSC 560	Data Science for Business	3
DTSC 600	Information Visualization	3
DTSC 650	Data Analytics in R	3
DTSC 690	Philosophical and Ethical Issues in Data Science	3
Electives		
DTSC 520	Fundamentals of Data Science	3
DTSC 550	Introduction to Statistical Modeling	3
DTSC 575	Principles of Python Programming	3
DTSC 580	Data Manipulation	3
DTSC 620	Cloud Foundations	3
DTSC 660	Data and Database Management with SQL	3
DTSC 670	Foundations of Machine Learning Models	3
DTSC 691	Applied Data Science	3
BUSA 505	The Business Environment	3
BUSA 585	Financial Accounting	3
HMGT 526	Healthcare Finance and Economics	3

Certificate in Data Science

Course Number	Course Title	Credits
Required		
DTSC 520	Fundamentals of Data Science	3
DTSC 575	Principles of Python Programming	3
DTSC 600	Information Visualization	3
DTSC 660	Data and Database Management with SQL	3

Certificate in Data Analytics

Course Number	Course Title	Credits
Required		
DTSC 550	*Introduction to Statistical Modeling*	*3*
DTSC 560	*Data Science for Business*	*3*
DTSC 600	*Information Visualization*	*3*
DTSC 660	*Data and Database Management with SQL*	*3*

Curriculum Descriptions

Data Science & Data Analytics Courses

DTSC 520: Fundamentals of Data Science (3 credits): Introduction to foundational concepts, technologies, and theories of data and data science. This includes methods in data acquisition, cleaning, and visualization. Taught in Python using NumPy, Pandas, Matplotlib, and Git. Includes an introduction to Python, IPython, and Jupyter Notebooks.

DTSC 550: Introduction to Statistical Modeling (3 credits): Introduction to foundational concepts, theories, and techniques of statistical analysis for data science. Students will begin with descriptive statistics and probability, and advance through multiple and logistic regression. Students will also conduct analyses in R. This course is approachable for students with little statistical background and prepares them for DTSC 650: Data Analytics in R

DTSC 560: Data Science for Business (3 credits): This course explores the various ways data and science can be applied to business contexts. Particular emphasis will be placed on analytics using data to make informed business decisions. Approachable for students who have an understanding of basic statistics and beginner-level experience with R.

DTSC 575: Principles of Python Programming (3 credits): This course will teach students the introductory skills of programming, problem solving and algorithmic thinking in Python. Topics include variables, input/output, conditional statements/logic, Boolean expressions, flow control, loops and functions. Approachable for students who have no experience with Python.

DSTC 580: Data Manipulation (3 credits): This course focuses on the loading, manipulating, processing, cleaning, aggregating, and grouping of data. Students will practice on real world data sets, learning how to manipulate data using Python and continue their study of intermediate and advanced topics from the NumPy and Pandas libraries. Prerequisite: Students should have either taken DTSC520 or have previous Python for data analysis knowledge/experience.

DTSC 600: Information Visualization (3 credits): This course is designed to teach students the best practices in Data Visualization, the key trends in the industry, and how to become great storytellers with data. Students taking this class will learn the importance of using actionable dashboards that enable their organizations to make data-driven decisions. For this class students will use Tableau, one of the most used visual analytics platforms in the industry.

DTSC 620: Cloud Foundations (3 credits): This course will introduce students to the advantages and vocabulary of cloud computing. Students will gain exposure and experience with cloud-based core resources for compute, storage, database, and networking tasks. Students will explore best practices for cloud architecture, including operational excellence, security, shared responsibility, cost optimization, reliability, and scalability.

DTSC 650: Data Analytics in R (3 credits): Continuation of DTSC 550, with an emphasis on statistical techniques most used in modern data science. Will explore in greater depth linear and logistic regression, and continue additional regression and classification techniques with a focus on application. Analyses will be completed in R.

DTSC 660: Data and Database Management with SQL (3 credits): This course offers a comprehensive overview of data organization and management using relational database systems and the SQL programming language. The course introduces students to database systems and their applications, with a focus on designing and implementing database solutions based on user and data requirements.

DTSC 670: Foundations of Machine Learning Models (3 credits): Introduction to machine learning landscape. Will address questions such as what is machine learning? Why do we use machine learning? What is machine learning appropriate for? What is it inappropriate for? Will explore supervised and unsupervised learning, regression and classification models, and support vector machines. Taught in Python. Prerequisite: Students should have either taken DTSC 520: Fundamentals of Data Science, DTSC 575: Principles of Python Programming, and DTSC 580: Data Manipulation or have previous Python for data analysis knowledge/experience.

DTSC 680: Applied Machine Learning (3 credits): Continuation of DTSC 670. Further exploration of modern machine learning applications. Topics include neural networks and deep learning, including an emphasis on model selection and tuning. Taught in Python. Prerequisite: DTSC 670: Foundations of Machine Learning. Available for MSDS degree only.

DTSC 685: Natural Language Processing (3 credits): This course will introduce the field of Natural Language Processing (NLP) and its related algorithms and ideas. Students will gain experience writing NLP algorithmic code in Python, as well as working through text-based machine learning problems. Prerequisite: DTSC 580 Data Manipulation, DTSC 670: Foundations of Machine Learning Models. Available for MSDS degree only.

DTSC 690: Data Science Capstone: Ethical and Philosophical Issues in Data Science (3 credits): Part one of the capstone in the Masters in Data Science. Students will explore

contemporary ethical and philosophical issues in data science and artificial intelligence. Subjects include basic and advanced issues, ranging from social media privacy to implications of machine learning and artificial intelligence for religiousness. Can be taken jointly with DTSC 691. Prerequisite: DTSC 670: Foundations of Machine Learning Models.

DTSC 691: Data Science Capstone: Applied Data Science (3 credits): Part two of the capstone in the Masters in Data Science. Students will also complete a capstone project integrating their learning across courses. Students will complete a project proposal, including their data source, acquisition, cleaning, analysis, and presentation intentions. Can be taken jointly with DTSC 690. Prerequisite: DTSC 670: Foundations of Machine Learning Models.

Business Courses (available for MSDA only)

BUSA 505: The Business Environment (3 credits): Organizations of every size utilize core business functions and concepts such as marketing, human resources, accounting, financial management, economics, information systems, and operations management. Managers must understand these functional areas and the relationships between them in order to competently lead their team within the organization. This foundational course in the MBA program provides this necessary context and sets the stage for students to delve deeper into these concepts throughout their program.

BUSA 585: Financial Accounting (3 credits): This course overviews the processes of financial reporting, summation, and analysis. Students will learn how to prepare and interpret financial statements, evaluate an organization's financial health, and forecast future financial decisions. The emphasis of this course will be on the managerial insights of financial accounting rather than day-to-day accounting practices. Students will be equipped with the skills and knowledge to effectively and responsibly manage the financial aspects of their teams, departments, and organizations.

HMGT 526: Healthcare Finance and Economics (3 credits): A critical review of the areas of finance and economics as they affect the U.S. Healthcare Industry. This course expands on core finance and economics MBA courses by focusing on the unique applications healthcare professionals need to successfully contribute to their organizations. These include revenue streams, third party payers, planning, pricing, performance measurement, supply, demand, elasticity, public policy, and consumer behavior. Additionally, students consider the ethical and legal ramifications of finance, economics and healthcare. Prerequisite: Students are strongly recommended to successfully complete BUSA 585 and have a prior economics background prior to HMGT 526.

Program of Study Schedules

In data science and data analytics, knowledge is sequential or cumulative throughout the program of study, and courses are therefore structured in clear sequences. Your individual

course schedule will be based on when you matriculated into the program and whether you are a full-time or part-time student. Eastern University currently offers every course, every term.

Please refer to the [Program of Study Schedule](#), located in the Master's in Data Science Brightspace page, that reflects when you started the program and your status (full-time versus part-time) when registering for courses. Note that there is a specific suggested order of classes for students wanting to take two classes per term for the entire program.

If you deviated from your original Program of Study, please contact the Academic Advising Manager for information related to your modified Program of Study to ensure appropriate sequencing and timely graduation.

Course Delivery

Courses are taught through Brightspace, Eastern's learning management system. It is expected that you will watch the videos, complete the optional, non-credit quizzes, and proceed to any required exams and/or assignments. However, if you prefer to learn from another resource, that is okay, too - we simply want you to learn.

Because these are self-paced courses, our expectation is that you will learn using our lectures, the text, or other resources we provide. We also encourage you to look at online sources like https://stackoverflow.com/ (an indispensable resource) when you encounter a problem. The main reason to turn to these resources is that we want you to be able to find help when you need it, and not rely on a response from us 24-48 business hours after your email. Indeed, learning to find assistance quickly is an important skill to learn in and of itself! However, please note that you may not turn in any code you do not generate directly. You may use online resources to understand errors or to learn how portions of code work, but you may not use any solutions you might come across. The point of using these resources is to learn how the code works, not to find solutions.

While our courses are self-paced, it is critical that you work ahead of time. If you choose to wait until the end of the term to complete work it is your choice, but you will not be given additional time if you encounter last minute problems such as issues with technology, Brightspace, email, etc. Unforeseen circumstances warranting incompletes are discussed in the "[Incompletes](#)" academic policy section.

DTSC 691 Policies and Procedures

DTSC 691 is part two of the capstone in the Master's of Science in Data Science and Master's of Science in Data Analytics programs where students will complete a capstone project integrating their learning across courses. Students will complete a project proposal, including their data source, acquisition, cleaning, analysis, and presentation intentions. Can be taken jointly with DTSC 690.

Prior to the start of DTSC 691, students should spend a good amount of time considering the type of project they are interested in. While this is largely flexible, there are default project options students can consider:

- [Database Project Guidelines](#)
- [Data Science for Education Project Guidelines](#)
- [Machine Learning Project Guidelines](#)
- [Custom Project Guidelines](#)

If you are interested in learning more about the project, please see the [DTSC 691 project handbook](#).

If students are interested in receiving feedback about a potential DTSC 691 project prior to the course beginning, please email dtsc_691@eastern.edu.

Course Administration

Course Registration

Note: You DO NOT need advisor approval to sign up for courses

- [Guide to Online Registration through Student Planning](#)

- [Video on How to Register for New Classes](#)

Here are some basic tips on course registration:
- You must select a course section even if only one section of a course is offered
- The order in which your courses are listed on your course planning screen is numerical and is NOT the recommended order for completion particularly if you want to take two classes per term for the entire program
- Be sure to use the arrow keys to scroll over to the correct term before trying to register
- Check to ensure that you have completed any prerequisites for your course selections (can be reviewed in the Course Catalog section)
- Confirm that your course selection has the word "Registered" next to it on your course plan. If the course has the word "Planned" you are NOT properly registered

Add / Drop Courses

- [Dropping Withdrawing and Troubleshooting](#)

Withdrawal from Program

If you are only taking a couple of terms off, then you do not need to do anything other than dropping any course(s) you are currently registered for.

Students who are taking time off from the University should complete the online Exit Interview form. Students will have to submit an Application for Readmission (short 1-page form) on the Registrar webpage when they are ready to return. Registrar forms can be found here: https://www.eastern.edu/about/offices-centers/office-registrar/registrar-forms

Important Dates & Academic Calendar

For important dates and information about the semester, please view the Accelerated 7 Week Calendars located on Eastern's website.

All dates and times listed are in the Eastern time zone (ET).

Navigating Eastern's Website

- Tutorial on Navigating EU's Website

Learning Opportunities

Online Learning Environment (Brightspace)

Courses are taught through Brightspace, Eastern's learning management system. Courses can be viewed in BrightSpace on the first day of the term. You will continue to have access to your previous courses and their content after the term's end.
Tutorials for BrightSpace can be viewed here:
- Eastern's Brightspace guide
- Brightspace Tutorials on YouTube

Course Textbooks

Please note that some textbooks are only available in print format. We recommend that you attempt to secure textbooks early in order to account for shipping times.

Course Number	Course Title	Text
DTSC 520	Fundamentals of Data	Free, online sources only

	Science	
DTSC 550	Introduction to Statistical Modeling	Free, online sources only
DTSC 560	Data Science for Business	Camm, J.D., Cochran, J.J., Fry, M.J., & Ohlmann, J.W., (2021). Business Analytics, 4th Edition
DTSC 575	Principles of Python Programming	Highly suggested, but not required: Lubanovic's *Introducing Python: Modern Computing in Simple Packages*, Second edition. ISBN 97814920051367
DTSC 580	Data Manipulation	Highly suggested, but not required: Wes McKinney's *Python for Data Analysis*, Second edition. ISBN: 9781491957660
DTSC 600	Information Visualization	Storytelling with Data: A Data Visualization Guide for Business Professionals. Publisher : Wiley; 1st Edition The Tableau Workshop: A Practical Guide to the Art of Data Visualization with Tableau. Sumit Gupta, Sylvester Pinto, et. al. ISBN 978-1-80020-765-3
DTSC 620	Cloud Foundations	Free, online AWS sources
DTSC 650	Data Analytics in R	Free, online sources only
DTSC 660	Data and Database Management with SQL	DeBarros, Anthony. Practical SQL: A Beginner's Guide to Storytelling with Data. Second Edition. No Starch Press. ISBN 978-1-7185-0106-5
DTSC 670	Foundations of Machine Learning Models	Geron's *Hands-on Machine Learning with Scikit-Learn, Keras, & TensorFlow*, ISBN 9781492032649
DTSC 680	Applied Machine Learning	Geron's *Hands-on Machine Learning with Scikit-Learn, Keras, & TensorFlow*, ISBN 9781492032649

DTSC 685	Natural Language Processing	PDF written by Jacob Eisenstein that will be posted to the Brightspace page
DTSC 690	Data Science Capstone: Ethical and Philosophical Issues in Data Science	Free, online sources only
DTSC 691	Data Science Capstone: Applied Data Science	Depends on your personal project; no specific text required

Software Downloads

Software requirements will vary from course to course. You can find instructions for download for most software either on the main Brightspace page or directly in your course. Here is a list of the main required software downloads for the program:
- Python
- Jupyter notebooks (download through Anaconda)
- R & RStudio
- Git & GitHub
- Qlik
- Tableau
- Tensorflow & Keras
- Text editor or IDE of your choice
- AWS (online access)

Assessment and Feedback

Assessment Summary

Check your course syllabus for specific details about how you will be accessed. Generally, courses have exams, automatically graded coding assignments, manually graded coding assignments and/or projects.

For most courses, you will be able to retake exams. Exams will consist of a random pool of questions; therefore, each time you take the exam you should expect to see different questions. Exams are set up such that you will see a random selection of questions from each topic in a module, though, so you should be quizzed over a representative selection of questions.

Grading

Grade Scale for Individual Courses

93+ A

90 A-

87 B+

83 B

80 B-

77 C+

73 C

70 C-

<70 F

Grading System for Program

In order to graduate, you need a cumulative 3.0 GPA or higher (see catalog). Your course syllabus outlines the letter grade that corresponds to the percentage you received in the course. Those letter grades contribute to your GPA in the following manner:

GRADING SYSTEM

Following are the grades and the quality points assigned to each.

Grades – Grade points per semester hour

A+, A, A- . . . . Excellent 4.0, 4.0, 3.7
B+, B, B- . . . . .Good 3.3, 3.0, 2.7
C+, C, C- . . . . Fair 2.3, 2.0, 1.7
F   . . . . No Credit/Fail 0
I   . . . . Incomplete 0
P   . . . . .Pass
W   . . . . .Withdrawn
WF   . . . . .Withdrawn Failing 0

Assignment Feedback

For exams, you will be able to view your quiz/exam for a total of 15 minutes. You will see which questions you missed, but it will not show you the answers. For automatically graded coding assignments, you will be able to see the difference between the expected output for the assignment compared to your output. For manually graded assignments, you will be able to view the graders comments for any parts of the assignment where the grader wants to draw your attention to something in your code.

Academic Support

Graduate Assistants

Graduate Assistants (GAs) in the Master's in Data Science program are exemplary students who not only demonstrate strong, documented excellence in course content, but also show a commitment to assisting other students in a compassionate, patient, and respectful manner. In exchange for commitment to being a GA in one course, the GA will receive a tuition waiver for one of their courses. GAs can only GA one course at a time.

More information about applying for a GA position can be found here: GA Responsibilities and Application Instructions

Writing Center

At the Writing Center, writing assistants work with students in a personal, one-on-one environment, helping students improve writing basics such as punctuation, structure, and documenting sources. In addition, they identify areas of strength and weakness, and solve problems with written expression. The goal of the Writing Center is to help students improve their writing skills and become more proficient in reviewing and revising their own work.

Learn more on the Writing Center's website:
https://www.eastern.edu/student-life/counseling-academic-support/writing-center

Communication

You are responsible for all communication you receive to your eastern.edu email account. You will receive email updates for classes, registration, career services, etc., through your Eastern email exclusively. We also suggest that you use your Eastern email account when responding to Faculty or Staff to ensure that email does not accidentally end up in a spam folder.

Students should expect responses to all communication within 24-48 hours, excluding weekends.

The primary method of communication is through email and discussion boards. Phone or Zoom calls are possible if primary methods are unsuccessful.

- For advising inquiries, email dsadvising@eastern.edu
- For Brightspace problems, email brightspace@eastern.edu
- For technology problems, email dtsc_techsupport@eastern.edu (check with your course GA first as a lot of issues are assignment specific and not actual technology problems)
- For course content questions, you may create a thread in the appropriate discussion board on Brightspace or email GAs or your instructor, as indicated in syllabi

- For general program questions, email datascience@eastern.edu

Brightspace Discussion Forum & Graduate Assistants

For questions about course content, such as issues about exam content or to get a better understanding of a topic, the primary way to communicate will be with graduate assistants (GAs) and fellow students through the discussion boards. We encourage you to first consider posting to the discussion board when you have questions. Graduate assistants will do their best to respond to your questions within 24 to 48 business hours, and other students can answer questions as well.

General Program Assistance

If you have general questions about the program, please email datascience@eastern.edu. When you email, one of our employees will check the email and decide who should answer. Sometimes they will have the answer, but other times they will reach out to other employees who can help with Brightspace, stats, or coding.

Of course if there are things that are more personal, always feel free to reach out to the instructor of your course.

Career Resources

Center for Career Development

The Office of Talent and Career Development specializes in assisting Eastern University undergraduate and graduate students as they consider their plans for the future in the following ways: discovering God-given talents; choosing a major/minor; developing resumes, cover letters, and application materials; gaining experience through internships/practicums; and enhancing networking, job search, and professional skills. More information, resources, and our career event calendar are available at www.eastern.edu/careers.

To set up an appointment with a career counselor, please email careers@eastern.edu or stop by Walton 202 if you live near campus. Log in to Eastern's online exclusive internship and job board, Handshake, at eastern.joinhandshake.com.

Student Feedback

We welcome student feedback on the program in general, individual courses, and this policy handbook. If you have feedback on the program in general or this handbook, please email us at datascience@eastern.edu. If you have feedback on a specific course, we encourage you to email the course instructor directly.

It is our desire that this program continues to grow and improve. With that goal in mind, we take student feedback very seriously and thank you in advance for your time.

Resources

There are many additional course resources, datasets, and FAQs that can be viewed on the [MS in Data Science and Analytics Programs general Brightspace page](#).