



**Michigan  
Technological**  
University

## **Data Science Graduate Program Student Orientation Handbook**

	2
<b>Welcome!</b>	3
<b>Program Governance</b>	7
<b>Getting Started</b>	5
International Programs & Services Office (IPS)	5
Housing Information	5
Identification Card (HuskyCard)	5
Office	5
After-hours Access	5
Parking	5
Payroll	6
<b>Degree Information</b>	7
Core Courses	7
Approved Electives	7
Foundational Courses	8
Domain Elective Courses	8
Home Departments / Advisors	8
Changing Advisors / Home Departments	8
Registration / Scheduling	8
Forms and Degree Completion Timelines	9
Tuition Payment	9
Continuous Enrollment	9
Career Placement	9
Internships / Co-ops	10
Enterprise	10
<b>University Policies</b>	11
External Transfer Credits	11
Senior Rule	11
Re-using Credits	11
Good Academic Standing and Dismissal	11
Academic Grievances / Grade Appeals	11
Policies for Repeating Courses	11
<b>Helpful Tips</b>	12
Formatting Papers and Citing Research Material	12
Skills and Research Methodology	12
Academic Integrity	12

## Welcome!

Welcome to the interdisciplinary Data Science Graduate Program at Michigan Technological University. The degree path you are embarking on will challenge you and stretch your capabilities. The many and varied skills you will develop are building blocks necessary for future success as a data scientist, leading teams of analysts in the pursuit of innovative and valuable insights. Even though this is a course-based curriculum, the separate courses will be integrated through hands-on, experiential projects. This fast-paced program of study will require an investment of time outside of class where you will practice skills and increase personal understanding.

Take time to get to know your fellow students and your faculty. Don't wait to be introduced; take the initiative to start building your professional network. You will have many opportunities to work in teams, so it is advantageous to learn the strengths and weaknesses of your peers.

The faculty is focused on helping you succeed. Reach out for assistance; don't wait until the end of the semester to seek help. It is your responsibility to gain the skills necessary.

This handbook is provided as a document to answer your basic questions. For more information, please refer to <http://www.mtu.edu/data-science>.

We wish you great success in the Data Science Graduate Program.

Sincerely,

*Benjamin W. Ong, Ph.D.*

Director, Data Science Graduate Program

## Program Governance

The Data Science program is managed by an inter-disciplinary community of scholars and professional staff working together to support this program. Some of the key personnel include:

[Dr. Benjamin Ong](#) - Data Science Program Director  
Home Department: Mathematical Sciences  
Office: Fisher 217, [ongbw@mtu.edu](mailto:ongbw@mtu.edu)

[Dr. Zhuo Feng](#) - Data Science Steering Committee,  
Home Department: Electrical and Computer Engineering  
Office: EERC 513, [zhuofeng@mtu.edu](mailto:zhuofeng@mtu.edu)

[Dr. Guy Hembroff](#) - Data Science Steering Committee  
Home Department: School of Technology  
Office: EERC 311, [hembroff@mtu.edu](mailto:hembroff@mtu.edu)

[Dr. Jeffrey Wall](#) - Data Science Steering Committee  
Home Department: School of Business and Economics  
Office: AOB G010, [jdwall@mtu.edu](mailto:jdwall@mtu.edu)

[Dr. Hairong Wei](#) - Data Science Steering Committee  
Home Department: School of Forestry and Environmental Science  
Office: Noblet 176, [hairong@mtu.edu](mailto:hairong@mtu.edu)

[Dr. Jianhui Yue](#) - Data Science Steering Committee  
Home Department: Computer Science.  
Office: Rekhi 203, [jyue@mtu.edu](mailto:jyue@mtu.edu)

Most inquiries can be directed towards Dr. Ong. E-mail is the preferred mode of communication.

## **Graduate Student Government (<http://gsg.mtu.edu>)**

Data Science Representative: Sashikanth Nagula, [snagula@mtu.edu](mailto:snagula@mtu.edu).

Mr. Nagula will communicate information regarding travel grants, social activities, opportunities and other important information. he can also be used as a contact to communicate suggestions, complaints, and help to answer questions.

## Getting Started

Listed below are several items to assist you in your orientation at MTU and the Data Science program. Some require your personal attention; others are informational only.

### [International Programs & Services Office \(IPS\)](#)

All international students are required to report to International Programs and Services, Administration Building, Room 200 if you haven't checked in already. Bring your I-20 or DS-2019, passport and visa.

### **Housing Information**

- On-campus: <http://www.mtu.edu/housing/>
- Off-campus: <http://usg.mtu.edu/usg/housing/>

### **Identification Card (HuskyCard)**

All students are required to have a HuskyCard for identification and swipe access to buildings, parking lots, and residence halls if applicable. HuskyCards are issued at the HuskyCard Service Center in the IT Service Center, 1st floor of the Van Pelt and Opie Library. A valid government-issued photo ID is required, such as a driver's license, a state ID or a passport.

### **Office**

Office space is only provided for supported GTA/GA/GRAs if requested.

### **After-hours Access**

Swipe card after-hours access to the buildings and computer labs will automatically be provided to all enrolled students. If you have been assigned an office space, you will be notified by email when your key is ready to be picked up at Public Safety & Police Services, 206 MacInnes Drive (building 16 on campus map). You will need your MTU ID card (HuskyCard) to pick up your key. If lost, you will be charged \$100 for a replacement key.

### **Parking**

[See the Transportation Services](#) website for detailed information regarding the vehicle registration process, parking fees, and rules/regulations regarding parking. [Vehicle registration/parking permit purchase](#) is available online. Bring your vehicle registration and your picture ID to Transportation Services, 100 Administration Building, to pick up your parking permit. During off-hours (4pm-7am weekdays) and all weekend, core campus parking lots and parking meters are open for parking (exception is handicap and designated parking spaces).

To allow for snow removal, parking is prohibited on campus between 2:00am and 7:00am, from November 1 through April 30 (regardless of if there is/isn't snow on the ground). Exceptions: Campus housing residents may park in their designated lots. Those needing to park on campus overnight can ask for and receive a special overnight parking permit from transportation services. If it is after 5 p.m. on

weekdays, on a holiday, or on weekends, contact Public Safety and Police Services for parking permission. If you have car problems and are unable to move your vehicle, contact Transportation Services at 487-1441 during regular business hours (8am-5pm, Monday-Friday), and after hours, holidays, and weekends call Public Safety before the 2:00 a.m. deadline at 487-2216.

## **Employment Information**

[Michigan Tech Career Services](#), provides information that may assist students in locating employment.

### **International students ON-CAMPUS EMPLOYMENT**

- International students must limit on-campus employment to 20 hours per week while school is in session. Students on J-1 visas must report on-campus employment to IPS.
- You cannot work off-campus without prior approval from IPS.
- You will need to apply for a Social Security Number if you have an on-campus job offer. Bring your job offer letter to IPS for further instructions.

### **Apply for a Social Security Number (SS# or SSN)**

IPS has all the details on [employment options](#). Before accepting any kind of job, contact IPS to find out if your visa allows you to work, and about other forms and requirements that may be required including applying for a Social Security Number. Please request a receipt confirming the SSN application, and return receipt to the graduate school, Admin 411, if you have been hired as a GTA/GRA/GA.

## **Payroll**

GTA/GRA/Fellowship awardees, please see Ms. Kim Purri in Fisher 311 to be set up on payroll as soon as possible to avoid a delay in pay. Pay disbursements are issued every two weeks. Direct deposit can be set up online in Banweb under Employees, Pay Information, Direct Deposit allocation.

Fellowship recipients are paid monthly as a non-payroll disbursement. Direct Deposit can be set up for non-payroll payments online in Banweb under Employees, Non-Payroll Direct Deposit Destination.

## Degree Information

The Data Science Masters is a course-based program requiring successful completion of 30 approved credits within five years of starting the program. Specifically,

- 12 credits of core courses must be successfully completed
- at least 6 credits of approved electives must be successfully completed
- at most 6 credits of foundational courses may be taken
- at most 12 credits of domain electives may be taken.

A passing grade (B or higher) must be obtained in 24 of the above 30 credits; a grade of BC or C may be accepted for the remaining 6 of the 30 credits. Additionally, at least 18 credits must be taken at the graduate level (5xxx and 6xxx).

### Core Courses

The following four courses are **required** for the Data Science degree. These courses are offered only once a year. You will need to plan accordingly.

Fall	UN 5550 MA 5790	Introduction to Data Science Predictive Modeling
Spring	CS 4821/CS 5831 BA 5200	Data Mining Information Systems Management and Data Analytics

### Approved Electives

At least 2 courses must be taken from the list of approved elective courses below:

- CS 5841/EE 5841 — Machine Learning (Spring)
- CS 5491 — Cloud Computing (Spring)
- CS 5471 — Advanced Topics in Computer Security (Fall, Spring)
- CS 5631 — Data Visualization (Fall, Spring)
- MA 5770 — Bayesian Analysis (Fall)
- MA 5781 — Time Series Analysis and Forecasting (Spring)
- MGT 4600 — Managing Innovation & Technology (Spring)
- PSY 5210 — Advanced Statistical Analysis and Design (Fall)
- FW 5083 — Bioinformatics Programming and Skills (Fall)
- UN 5390 — Scientific Computing I (On Demand)
- UN 5395 — Scientific Computing II (On Demand)
- SAT 5990 — Introduction to Hadoop and its applications (Special Topic)

\*\* Class offerings might change without notice. Please refer to the Registrar's schedule of classes for actual class offerings.

## Foundational Courses

A maximum of six credit hours of foundational skills course may be applied to the MS in Data Science. These courses will build skills necessary for successful completion of the MS in Data Science. Some students will not need to take these foundational courses and will instead use the domain electives to reach the credit requirements of this program. A [list of foundational courses](#) that can be taken towards the data science program is listed:

## Domain Elective Courses

[View an extensive list of domain elective courses](#) that can be taken towards the data science program. At most 12 credits of domain elective courses can be taken towards the data science degree

## Home Departments / Advisors

The Data Science program is an interdisciplinary collaboration across the university; Data Science graduate students will have an opportunity to select an advisor and home department that matches their interest/domain background. There will be an opportunity to meet some of the advisors during the data science program orientation; program orientation for fall and spring admissions typically occur the week before classes begin. Students will be asked to select and meet with an advisor by the second week of their first semester. Advisors and home departments should typically be selected based on which domain electives you intend to specialize in. For example, if you intend to mostly take courses offered by the Math department as your domain electives, you should consider requesting Dr. Ong as your advisor, and the Math department as your home department. Your advisor should provide academic and career advising. Academic advising entails ensuring that your courses are suitable for your career goals and you have the necessary background to succeed in the courses. Career advising entails providing you a glimpse of what the industry in your domain specialization might look for in potential hires, connecting you with other researchers in their department/college, and potentially connecting you with recruiters.

It is our desire that students are incorporated into the activities of their home department, including the opportunity for GTA assignments within that department, access to common areas and lounges, networking with faculty and other graduate students in that department, attending department seminars.

## Changing Advisors / Home Departments

Within the data science program, there should be little cause to request a change of advisors or home departments. The advisors work together as a team, communicating with each other regularly as part of the steering committee.

To request a change of advisor or home department, please send an email, or meet with the graduate program director to initiate the process. The current advisor and the requested advisor should be contacted prior to initiating this process.

## Registration / Scheduling

[Reference the graduate course catalog](#). We recommend that your course schedule be determined in consultation with a member of the data science steering committee. It is important to set yourself up for success by ensuring that you have a suitable background to succeed in this interdisciplinary program. There are various foundational courses that can help strengthen your background in statistics, business or computing. All students should take UN5550, Introduction to Data Science, in the Fall of their first year of study.



You may [register online](#) using the Banweb system or register in person at the Registrar's Office, Room 130 of the Administration Building. Courses can be dropped or added through the first week of class without accruing any late penalty. If you have not paid for your courses by Wednesday of the first week of classes, your courses will be dropped.

### Forms and Degree Completion Timelines

An important resource is the [Graduate School's Forms and Deadlines webpage](#). It is the student's responsibility to complete forms and training courses in a timeline fashion. Failure to meet submission deadlines could result in delayed completion of a student's graduate degree. NOTE: graduate students must maintain a university cumulative GPA of 3.0 or above to be eligible for graduation.

### Tuition Payment

After scheduling courses, go to MyMichiganTech to receive a copy of your schedule and tuition bill. You may pay your student bill online with American Express, MasterCard or Discover (2.3% transaction fee applies) or e-check, or at the Cashier's Office located within the Student Financial Services Center in the Administration Building. Note: Credit/debit card payment not taken at Cashiers Office or by phone.

For supported students only (GTA/GA/GRA): After scheduling courses, go to Banweb to view a copy of your schedule and tuition bill. Computer fees and tuition for up to 9 credits per semester will be paid by the program for fully supported students. You are responsible for the student voted fees such as the Student Activity Fee, and Experience Tech Fee, etc.

### Continuous Enrollment

Students must be enrolled every academic-year (fall and spring) semester until they complete their degree. "Completing" a degree means successfully completing all required courses and turning in all required paperwork. Graduate students are not required to register for summer session in order to fulfill the continuous enrollment policy.

\*\* International students are further required to maintain full-time status for fall and spring semesters, as a condition of their visa. [Reduced course-loads](#) are permissible only in certain circumstances, please refer to documents and forms that are required on the website.

### Career Placement

- Use the [career center](#) for help with interviews and resumes. In addition, you should plan on attending the Fall and Spring Career Fairs for finding internships and job leads.
- Students are strongly encouraged to create a [Linkedin](#) account and connect with the Michigan Tech Alumni Group. Social networking can be beneficial for expanding professional associations.
- [Part-time on-campus employment opportunities](#) for students may be available. The career center also maintains a list of local jobs aimed at Michigan Tech students: [www.career.mtu.edu/students/jobpostings.php](http://www.career.mtu.edu/students/jobpostings.php), and [www.career.mtu.edu/students/jobresources.php](http://www.career.mtu.edu/students/jobresources.php)

### **Internships / Co-ops**

Internships and co-ops can provide valuable experience to your data science degree, in addition to expanding your network for future job prospects. To participate in a co-op, students must have a cumulative GPA of 3.0 or above, and adhere to deadlines posted at on the [Career Services Coop webpage](#). International students should contact IPS to ensure that requirements of their visas are fulfilled.

\*\* Only internships and co-ops that are relevant to your data-science program may be counted towards the academic fulfillment of your data science degree. Students who wish to count co-op experience towards the academic fulfillment of the data science degree should provide the offer letter / job description to the program director for prior approval. If approved, up to three (3) credits of Co-op (UN 5000/ UN 5001 / UN 5002) can be counted towards academic fulfillment of the data science degree as a domain specialization elective.

### **Enterprise**

In the Fall of 2018, we piloted several data science graduate enterprise projects. The enterprise project is intended to be a multi-semester learning experience, working on projects provided by industry. We are still trying to develop a path for data science graduate students to participate meaningfully in Enterprise. This will be updated as more information becomes available.

## University Policies

Here are some of the university policies that pertain to the data science program. A full listing can be found on [the Dean of Students website](#).

### External Transfer Credits

To [transfer credits from another university or college](#) to the data science program, please be aware that:

- A maximum of six transfer credits can be applied towards the Data Science degree unless special arrangements have been made between Michigan Tech and the second institution.
- A grade equivalent of “B” or better must be earned in the course to be transferred.
- The proposed course to be transferred must be pre-approved by the Data Science Executive Committee before the end of the semester **prior** to the semester you intend to take the transfer course, and must be taken at an institution accredited by the Higher Learning Commission (HLC). The course cannot duplicate courses that have already been taken at Michigan Tech. The student will provide the name of the university, a course number, name, and description, and the **most recent** syllabus for the course. A Michigan Tech faculty member responsible for teaching the required course will be consulted as to whether the proposed course is of equivalent content.

### Senior Rule

Michigan Tech undergraduates may take up to 10 Data-Science approved credits hours in their senior year, and use these credits towards a Data Science Master’s degree. A grade of “B” or higher must be attained for these credits to count towards the graduate degree. These credits do not count towards the undergraduate degree, and are independent of double-counted courses.

### Re-using Credits

Students may double count up to 12 credits from one other Michigan Tech graduate program toward a Data Science master’s degree, with the approval of the Data Science Program Director. Graduate credits earned toward the **completion** of a graduate degree at an institution other than Michigan Tech **cannot** be applied toward this degree program (this is a Michigan Tech policy).

### Good Academic Standing and Dismissal

The Data Science Graduate Program follows the Graduate School policies on [Good Academic Standing and Grading Policy](#).

### Academic Grievances / Grade Appeals

Students wishing to appeal a grade assigned by a faculty member at Michigan Tech should follow the procedure described in the [Michigan Tech Policy Statement under Academic Grievances](#).

### Policies for Repeating Courses

For the data science degree, up to six (6) credits may be accepted with a B/C or C grade. Overall a 3.0 GPA must always be maintained, failure to do so will result in academic probation.

Required courses can only be repeated once. If a student fails to earn a B or above in a required course after taking the required course twice, the student will be recommended for dismissal from the program. This policy applies even when the course is repeated at another institution.

## Helpful Tips

### Formatting Papers and Citing Research Material

All of your instructors expect you to properly cite and document sources of information in your work. Different instructors will prefer different formatting styles. Plagiarism is not tolerated and can result in dismissal from the graduate program. Be sure you are familiar with what constitutes a violation. When in doubt, please ASK your instructor or research advisor. A detailed booklet is available that describes Michigan Tech's [academic integrity policy and procedures](#).

### Skills and Research Methodology

Although the Data Science Graduate Program is course-based, there will be numerous opportunities to work with professors on current research projects. Take the initiative to engage with faculty in your area of interest. Volunteer to assist with research tasks outside of class, above and beyond class assignments. Learn the methodology being used by the researcher. Be aware that:

- Statistics and quantitative skills are critical for data scientists. Not only should you be able to use a variety of statistical tools, but you also need to be able to understand the theoretical meaning and be adept at interpreting the results in productive and insightful ways.
- Core courses will require familiarity with a number of advanced computer skills. Invest time developing a solid understanding of a computer programming language such as Python, R and SAS. This will allow you to carry out more complex data analyses.
- Writing/communication skills are *essential* to a successful career. Michigan Tech provides assistance to improve your professional writing/communication. You should treat each and every writing/communication assignment as an opportunity to improve your communication skills.

### Academic Integrity

[Academic integrity and honesty](#) are central components of a student's education, and ethical conduct fostered in an academic context will be carried into a student's professional career. Academic integrity is essential in a community of scholars searching and learning to search for truth. Anything less than total commitment to integrity undermines the efforts of the academic community. Both students and faculty are responsible for upholding the academic integrity of the University.

Appendix: Degree Schedule - Masters in Data Science

**Required Coursework - 12 credits**

Semester	Course Number	Title	Credits	Grade
	UN 5550	Introduction to Data Science	3	
	MA 5790	Predictive Modeling	3	
	CS 4821	Data Mining	3	
	BA 5200	Information Systems Management	3	

**Elective Coursework - Minimum 6 credits**

Semester	Course Number	Title	Credits	Grade

**Foundational Coursework - Maximum 6 Credits**

Semester	Course Number	Title	Credits	Grade

**Domain Electives - Maximum 12 credits**

Semester	Course Number	Title	Credits	Grade