Master of Computational Data Science Program

Language Technologies Institute
School of Computer Science
Carnegie Mellon University

Version: August 22, 2016

Note: The information contained in this graduate handbook focuses on the resources and locations available at the Carnegie Mellon Pittsburgh Campus.
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1 Introduction

1.1 The MCDS Degree

The Master of Computational Data Science (MCDS) degree is a professional Master of Science degree offered by the Language Technologies Institute (LTI), a department in the School of Computer Science at Carnegie Mellon University. The MCDS degree offers students with a Bachelor's degree the opportunity to improve their training with advanced study in Computer Science and Machine Learning. We cater to students with basic analytic skills and a strong aptitude for mathematics, programming, and logical reasoning. An undergraduate degree in Computer Science is not required. Most students will complete the program in three semesters; students switching into Computer Science from another field may require additional time to fill gaps in their undergraduate training.

The MCDS Program offers several major programs of study; students entering the program are placed into one of them (see Section 3.3.6). Students construct their own course of study, in consultation with their major advisor, in order to satisfy broad guidelines. Thus, a student may tailor their coursework in a given major to follow a particular area of emphasis. The MCDS program is typically a 16-month program consisting of courses, seminars, a required Capstone Project and a required summer internship or practical training. While some MCDS graduates continue on to PhD programs in the LTI or other leading universities, most graduates go on to jobs in corporate research and development laboratories.

The program consists entirely of coursework and a Capstone Project, and no Master’s Thesis is required. However, students with an interest in research have many opportunities to work with faculty on research problems. There is no Doctoral program in Computational Data Science. However, because of the highly selective nature of the MCDS program and quality of the MCDS curriculum, performing well in the program will give a boost to a PhD application. MS graduates are welcome to apply to CMU PhD programs, but will not receive preferential treatment.

There are significant differences between CMU's different departments and degree programs in philosophical approach, procedures, policies and regulations. Each department issues a handbook that informs graduate students of their program requirements and procedures and ensures that students have written access to the standard information outlined below. This handbook describes the policies, procedures, and requirements for the Master of Computational Data Science (MCDS) degree.

While this handbook is specific to your academic experience in the department, there are several other resources and offices graduate students are encouraged to consult during their tenure at Carnegie Mellon University. Information about The Word, Carnegie Mellon University Student Handbook, the Office of the Assistant Vice Provost for Graduate Education, the Office of the Dean of Student Affairs and others are included in Appendix A of this handbook.

All policies not explicitly described in this document conform to School of Computer Science (SCS) policies and university policies described in The Word, Carnegie Mellon University Student Handbook and at the University Policies website.
1.2 **MCDS Contact Information**

The people responsible for administering the MCDS degree are:

<table>
<thead>
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<th>Name</th>
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<td>Gates-Hillman Center 6713</td>
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<td>5000 Forbes Avenue, Pittsburgh, PA 15213</td>
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The Language Technologies Institute is located primarily on the 5th and 6th floors of the Gates Hillman Complex (GHC) on Carnegie Mellon’s Pittsburgh campus:

**Language Technologies Institute**

Carnegie Mellon University

5000 Forbes Avenue

Gates Hillman Complex 5402, LTI

Pittsburgh, PA 15241-3891

412-268-6591 (phone)

412-268-6298 (fax)

[http://www.lti.cs.cmu.edu/](http://www.lti.cs.cmu.edu/)

1.3 **University Policies and Expectations**

It is the responsibility of each member of the Carnegie Mellon community to be familiar with university policies and guidelines. In addition to this departmental graduate student handbook, the following resources are available to assist you in understanding community expectations:

- The Word/Student Handbook: [http://www.cmu.edu/student](http://www.cmu.edu/student)
- Academic Integrity Website: [http://www.cmu.edu/academic-integrity](http://www.cmu.edu/academic-integrity)
- University Policies Website: [http://www.cmu.edu/policies](http://www.cmu.edu/policies)
- Graduate Education Website: [http://www.cmu.edu/graduate/policies/index.html](http://www.cmu.edu/graduate/policies/index.html)
1.4 Carnegie Mellon University Statement of Assurance
Carnegie Mellon University does not discriminate in admission, employment, or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Furthermore, Carnegie Mellon University does not discriminate and is required not to discriminate in violation of federal, state, or local laws or executive orders. Direct inquiries concerning the application of and compliance with this statement to the Vice President for Campus Affairs, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213; Telephone: 412-268-2056.

1.5 The Carnegie Mellon Code
Students at Carnegie Mellon are members of an academic community dedicated to the achievement of excellence, and are expected to meet the highest standards of personal, ethical and moral conduct. These standards require personal integrity, a commitment to honesty without compromise, as well as truth without equivocation and a willingness to place the good of the community above the good of the self. Obligations once undertaken must be met, commitments kept.

As members of the Carnegie Mellon community, individuals are expected to uphold the standards of the community in addition to holding others accountable for said standards. It is rare that the life of a student in an academic community can be so private that it will not affect the community as a whole or that the above standards do not apply. The discovery, advancement and communication of knowledge are not possible without a commitment to these standards. Creativity cannot exist without acknowledgment of the creativity of others. New knowledge cannot be developed without credit for prior knowledge. Without the ability to trust that these principles will be observed, an academic community cannot exist.

The commitment of its faculty, staff and students to these standards contributes to the high respect in which the Carnegie Mellon degree is held. Students must not destroy that respect by their failure to meet these standards. Students who cannot meet them should voluntarily withdraw from the university.


2 The Language Technologies Institute

2.1 Main Office
The LTI reception desk is in Room 5407 of the Gates Hillman Complex (GHC 5407). Mailboxes, printers, copiers, and other departmental resources are across the hall, in GHC 5404.

Please see Appendix A for additional information about university resources.
2.2 Photocopies and Printers

The use of a photocopier requires an access code. An access code can be obtained from the LTI administrative staff. Do not share your access code with anyone outside of the department.

The use of a printer requires a CS user id (see the ‘Computers’ section). The School of Computer Science provides a number of black-and-white and color printers for use by students. SCS Computing Facilities maintains a list of printers at [http://www.cs.cmu.edu/~help/printing/](http://www.cs.cmu.edu/~help/printing/).

2.3 Office Space for MS Students

Full-time students in the LTI’s MS degrees on the Pittsburgh campus have access to shared office spaces, which help to create a sense of community and provide space for working when on campus.

2.4 Computers for MS Students

Students are expected to provide their own laptop computers that can be used to access university resources and complete course assignments. Laptops running Windows, MacOS, and Linux software are all acceptable.

MS students will be given a CS user id. A CS user id is required to use the LTI computer cluster, department printers, and other SCS services. The School of Computer Science has a Help Center located at 4203 GHC. They can be contacted at help@cs.cmu.edu, extension 8-4231 from a campus phone, or 412-268-4231 from an outside line.

MS students will be given access to the LTI’s computer cluster on an as-needed basis, to be used for course assignments, directed study projects, and/or the capstone project. The LTI cluster provides storage and computation for projects involving large datasets and/or lengthy computation.

3 MCDS Degree

This section describes the various rules and regulations that determine the attainment of a MCDS degree by the student.

3.1 Statute of limitations


As outlined in the Master’s Students Statute of Limitations, students who have matriculated at Carnegie Mellon will complete all requirements for the master’s degree within a maximum of seven years from original matriculation as a master’s student. Once this time-to-degree limit has lapsed, the person may resume work towards a master’s degree only if newly admitted to a currently offered master’s degree program under criteria determined by that program.

Under extraordinary circumstances, such as leave of absence, military or public service, family or parental leave, or temporary disability, a school or college may, upon the Director’s recommendation and with the written approval of the dean (or designate), defer the lapse for a period commensurate with the duration of that interruption. Students, who are pursuing a
master’s degree as part-time students for all semesters of their program, as approved by their program, may also appeal to the program Director for extension of the time to degree limit.

3.2 Full-time status and part-time status
In order to be considered a full-time student, a student must be registered for, and complete, a minimum of 36 units in every Fall and Spring semester. All international students are required by Federal Law to maintain full-time status. Failure to maintain full-time status will result in loss of a student visa (and, therefore, “permit of stay”). All students having a Stafford Loan are required to maintain full- or part-time status.

3.3 Degree Enrollment Process and Related Information

3.3.1 Duration of the degree program
The MCDS degree must be completed within five (5) years from the time that the student matriculates into the program.

3.3.2 Residency requirements
There is no formal residence requirement. However, most courses in the program are taught on campus without an option for distance education.

3.3.3 Course requirements and related policies/protocols
- In order to receive the degree, students must have a Quality Point Average (QPA) of 3.0. Completion of the degree is based on completing courses in the core curriculum, the MCDS seminar, electives and capstone project.
- The capstone project consists of students working at CMU on a research project, or on an industry-sponsored project.
- The student must complete 144 eligible units of study. This includes eight 12-unit courses, two 12-unit seminar courses and one 24-unit capstone course. Students must choose at minimum 5 core courses. The remainder of the 12-unit courses with course numbers 600 or greater can be electives chosen from the SCS course catalog. Any additional non-prerequisite units taken beyond the 144 units are also considered electives.
- A full-time student must take at least 36 units per semester. A student may not take more than 60 units per semester, without permission. Full-time students may elect, exactly once, to shift 12 units from the initial Fall semester to the subsequent Fall semester, although this shift will make the students in the systems major ineligible for the combined 7-month internship and capstone option. Students who elect to complete the program in 4 semesters must register for a full course load in their final semester; petitions for a Reduced Course Load (RCL) in the final semester are not permitted except under unusual circumstances.

3.3.4 Prerequisites
Over time we have discovered that many students are challenged in graduate level education due to a weakness in certain areas of undergraduate education. Thus, students are also required to pass the undergraduate course 15-513 Introduction to Computer Systems, typically in the summer before study commences. The student must pass with a grade of “B-” or better. Failure to pass the
course means that the student must take 15-213 or 15-513 during their first semester. (This path means that the student is thus taking an even larger number of courses during the semester.) Note that in both cases the units do not count towards the 144 eligible units of study, since both courses 15-513 and 15-213 are undergraduate courses.

3.3.5 Plan of study
The degree consists of four timing options based on the length of time the student spends working on the degree. The student chooses their timing at the start of the degree program (for visa requirements). Changes in timing are possible with approval of the Director of the degree program and approval by the US government visa change. Note that all degree options consist of the same amount of coursework:

- **Standard Timing** – a 16-month degree consisting of study for Fall and Spring semesters, a summer internship, and Fall semester of study. Each semester consists of a minimum of 48 units of study. This timing is typical for most students, and is the only timing that allows systems track students to do the combined 7-month internship and capstone option. The student graduates in December.

- **Extended Timing** – a 20-month degree consisting of study for Fall and Spring semesters, a summer internship, and a second year of Fall and Spring study. Each semester consists of a minimum of 36 units of study. This timing is designed for students interested in extending their time at CMU to complete a course of study. Note that the per-semester course load is lower, but the total cost is higher since four semesters of tuition are paid. This timing is also recommended for students interested in pursuing a PhD after graduation. The student graduates in May.

- **Accelerated Timing** – a 12-month degree consisting of Fall, Spring, and Summer semesters of study. Each semester consists of a minimum of 48 units of study. This timing is available to students who have several previous internships. The student graduates in August.

- **Part-Time Timing** – a degree of variable time, usually entailing several years, where a part-time student takes one or two courses per semester.

3.3.6 Choice of Major
Each student is offered admission to a specific major course of study, which governs the composition of the core courses that they will take. The three major choices available are Systems, Analytics and Human-Centered Data Science (HCDS). Switching majors is possible with permission of the Director and Co-Directors of the relevant majors. Note that switching may delay graduation because of the requirement of taking core courses. For a student to petition for a change of major they must have completed 15-513 with a “B-” grade or better, and be in good academic standing if they have already completed other courses in the program.

**MCDS Program Outcomes**
Depending on the choice of major, different learning outcomes are emphasized:

**Analytics.** During their time in the MCDS Analytics major, students will learn to:
• Design, implement and evaluate the use of analytic algorithms on sample datasets.
• Explain how a machine-learning model is applied and evaluated on real world datasets.
• Design, implement and evaluate a software system and machine-learning model on real world data sets at real world scale.
• Analyze and document data science requirements in different application domains and survey as well as critique state of the art solutions for those requirements.
• Organize, execute, report on, and present a real world data science project in collaboration with other researchers/programmers.

**Systems.** During their time in the MCDS Systems major, students will learn to:

• Apply and customize systems techniques to application specific data science conditions and objectives.
• Identify tradeoffs among systems techniques and contrast alternatives, within the context of specific data science application domains.
• Develop and justify design decisions in the context of state of the art data science domains and problems.
• Anticipate and avert structural and/or implementation problems with systems design, especially with scaling and tail distributions.
• Implement and evaluate complex, scalable data science systems, with emphasis on providing experimental evidence for design decisions.
• Interpret and comparatively criticize state of the art research talks and papers, with emphasis on constructive improvements.

**HCDS.** During their time in the MCDS HCDS major, students will learn to:

• Design, implement and evaluate a user experience prototype for a given user need.
• Explain how a machine learning model is applied and evaluated on real world datasets.
• Design, implement and evaluate a software system and machine learning model on real world data sets at real world scale.
• Apply behavioral research methods to data science problems.
• Survey, analyze and critique human centered data science problems in different application domains and their state of the art solutions.
• Organize, execute, report on, and present a real world data science project in collaboration with other researchers/programmers.

Throughout their coursework, students will take introductory courses on all those topics, practice them in advanced courses and seminars and demonstrate all learned skills in their Capstone project and internship. Students are encouraged to choose elective courses in the curriculum according to their professional goals and mastery of the main subjects.

### 3.3.7 Systems curriculum

The Systems major consists of five components. Detailed information on the curriculum is contained in the Systems major FAQ appended to this handbook.

1. Core Curriculum (Pick 5 core courses with at least 3 project courses)
2. Seminar in Data Systems 15-649 Section A in Fall 1 and 15-649 Section B in Spring 1
3. Data Science Systems Capstone Course 15-649 (Section C, D or E) in Fall 2
4. Three (3) Electives: any graduate level course 600 and above in the School of Computer Science (SCS)
5. An internship or practical training

3.3.8 Analytics curriculum
The Analytics major consists of five components. Detailed information on the curriculum is contained in the Analytics major FAQ appended to this handbook.

1. Core Curriculum (5 courses)
2. Data Science Seminar 11-631 in Fall 1 and Capstone Planning 11-634 in Spring 1
3. Data Science Analytics Capstone Course 11-632 in Fall 2
4. Three (3) Electives: any graduate level course 600 and above in the School of Computer Science
5. An internship or practical training

3.3.9 HCDS curriculum
The Human-Centered Data Science major consists of six components. Detailed information on the curriculum is contained in the HCDS major FAQ appended to this handbook.

1. Core Curriculum (2 courses)
2. Behavioral Research Methods Requirement (1 course)
3. HCI Requirement (3 courses)
4. Data Science Seminar 11-631 in Fall 1 and Capstone Planning 11-634 in Spring 1
5. Data Science Analytics Capstone Course 11-632 in Fall 2
6. Two (2) Electives: any graduate level course 600 and above in the School of Computer Science
7. An internship or practical training

3.3.10 Capstone project
The capstone project consists of students working in a team or individually on a project. The capstone project integrates the educational experience of the student. A capstone project is typically a CMU research project, or an industry sponsored project; occasionally students define capstone topics through communication with the faculty. Students interested in defining their own capstone topics should discuss with the major advisor as early as possible. The capstone project is a great opportunity for a student (or student team) to “show off” their unique skills and accomplishments. Capstone projects have been instrumental in the hiring decisions for several employers.

If approved by industry employer and MCDS director, MCDS students can combine their capstone project with a 7-month (Summer/Fall) internship, provided all other degree requirements have been met.
3.3.11 Elective courses
Each major includes elective courses. Electives can be any graduate level course (numbered 600 or above) in the School of Computer Science. Students use their elective courses to enhance study in an area of interest or to explore new areas of interest.

3.3.12 Undergraduate courses
Undergraduate courses are taken to address an area of weakness in the student’s prior preparation. Undergraduate courses (numbered less than or equal to 599) may be taken pass/fail or for credit, but do not count toward the 144 units of eligible study. The course and course grade will appear on the student’s transcript, but the course grade will not factor as part of the student’s QPA. Note that this rule applies to the prerequisite course 15-513.

3.3.13 Independent study course
Independent study courses allow students to cover study of a particular area of interest, and are used when there no formal course is available in a given subject area. Students who are interested in continuing to a Ph.D. degree often enroll in Independent Study, since it offers the opportunity to perform research directly with a faculty member. Independent study courses are considered electives.

Each independent study course must be advised and approved by at least one faculty member. Agreement to supervise an independent study course is purely voluntary on the part of the faculty member. It is the duty of the student, therefore, to negotiate the terms and conditions of the independent study with the pertinent faculty members of CMU who will be supervising the study. These individuals are referred to as “independent study supervisors.” Once the student finds someone who agrees to supervise such a course, he/she must:

1. Enter into an agreement with the independent study supervisor that includes course expectations, including deliverables.
2. Secure the “Independent Study Contract Form” from the MCDS administrator.
3. Complete the form, giving brief description of the work to be done, including deliverables and how they will be graded.
4. Secure signatures of both the student and the supervisor. Return the form to the MCDS administrator in order to obtain approval for the independent study from the Director.

Independent study contracts must be submitted no later than 3 weeks following the start of classes.

3.3.14 Double counting courses
No course may be used to complete two MCDS degree requirements, nor may a course satisfy requirements in two degree programs.

3.3.15 Courses outside of the School of Computer Science
Elective courses in other Schools at Carnegie Mellon may be taken with prior permission of the Director.
3.3.16 Grades
All courses offered by the SCS CMU are graded on the 4.3 grading standard [http://www.cmu.edu/policies/documents/Grades.html](http://www.cmu.edu/policies/documents/Grades.html). MCDS students must maintain a 3.0 overall average each semester. A student must obtain a B- or better grade in all courses, which count towards core requirements. If a student receives a C- or better, that course may count as an elective towards the degree requirements. All courses must receive a letter grade; courses taken pass/fail do not count towards the MCDS degree.

Enrollment Services is the only University office that can provide an official letter of enrollment, official transcript and enrollment verification. Enrollment verification can be requested online through The HUB at: [http://www.cmu.edu/hub/transcripts/verifications/enrollment.html](http://www.cmu.edu/hub/transcripts/verifications/enrollment.html).

3.3.17 Student review and academic probation
The MCDS program conducts an academic progress review at the conclusion of each semester in order to monitor individual student progress towards graduation. Should a student’s effort fall below the acceptable level of academic performance and/or fail to meet standards established by Carnegie Mellon University, the student may be dismissed from the program.

Should a student’s overall QPA drop below 3.0 during any given semester, he/she will be placed on departmental probation for the following semester and will be required to improve his/her grades to no less than an overall 3.0 QPA during that period. Failure to improve to an overall 3.0 QPA or better the following semester may result in termination from the program. In addition, should a student fail to meet University Policies established by Carnegie Mellon University, the student may be dismissed from the program.

After each academic progress review, a student may receive one or more letters indicating the result of the review. Warning letters are issued for the following cases:

- Overall QPA below 3.0 (Academic Probation)
- Semester QPA is below 3.0
- Grade below B- in a core course
- Academic Integrity Violation (AIV) (Defined later in this handbook)

A student may be terminated from the program for any of the following cases:

- If a student has received two Academic Integrity Violation (AIV) letters
- If a student has received three warning letters of any type from the MCDS program
- If the student has been found to infringe a University Policy, where such infringement is deemed terminable

Students who realize that one of these situations may apply to them are strongly encouraged to meet with the major advisor to discuss a plan to mitigate the situation. Students who find they are struggling in the program will have the best chances of success if they communicate early and often with the major advisor. In some cases the major advisor may suggest that a student enrolled in the three-semester program should extend to a four-semester program. Such a change is only possible during the first or second semesters; petitions to extend during the third semester are unlikely to be approved.
3.3.18 Incomplete grades
Carnegie Mellon University students are expected to complete a course during the academic semester in which the course was taken. However, if the instructor agrees, a grade of “I” (incomplete) may be given when a student has been unable to complete the work of a course. However, the work completed up to that date must be of passing quality and the grade of incomplete provides no undue advantage to that student over other students.

By awarding an “I” grade, an instructor must specify the requirements for the completion of the work and designate a default letter grade in the event that the student fails to complete the remaining work.

Students must complete the required course work by no later than the end of the following academic semester or sooner if required by the instructor.

The instructor must record the permanent course grade by the last day of the examination period of the following semester, or the Registrar will automatically assign the default grade.

If further work has not been completed after one semester and a default grade is rendered, the default grade will become the grade of record.

3.3.19 Change of grades and missing grades
If a grade has been assigned in error, it can be changed to a different permanent grade. The procedure for changing a grade is as follows:

- Discuss the matter with the course instructor; provide evidence that the grade issued was not the grade earned.
- If the instructor agrees, the student should contact the program administrator to process a Change of Grade Form in order to correct the grade that was issued in error. Generally, the instructor is the final authority for a course grade.
- If a grade has not been assigned, please notify the course instructor for the completion of a Missing Grade Form.

3.3.20 Qualifying examinations and procedures (or equivalent)
None required.

3.3.21 Thesis/dissertation
None required.

3.3.22 On transfer to another program
If the requirements for the MCDS degree have not been completed when a student leaves to pursue another academic program, the degree will not be awarded. Completion of the MCDS degree does not guarantee admission into any doctoral degree program at Carnegie Mellon University. The courses that will be completed as part of the MCDS may serve to enhance one’s application to these programs but will in no way insure admittance.
3.3.23 Intellectual property policy
The MCDS degree program adheres to Carnegie Mellon University policy on intellectual property: http://www.cmu.edu/policies/documents/IntellProp.html

3.3.24 Teaching requirements
None required. However, students are encouraged to apply for teaching assistant positions in courses where they have excelled.

3.3.25 Language proficiency requirements
None required. However, non-native English speakers are encouraged to take advantage of the various support functions provided by the Intercultural Communication Center (ICC) and the Global Communication Center (GCC).

3.3.26 Academic Integrity and Policies on Plagiarism and Cheating
Please review the University expectations at: http://www.cmu.edu/academic-integrity/

Please review the entire policy at:
http://www.cmu.edu/policies/student-and-student-life/academic-integrity.html

The university considers any form of cheating or plagiarism to be a serious violation of student ethics. The student is required to understand and rigorously follow only the permitted forms of collaboration as defined by the instructor in every class. The work you submit must be your own, unless you have clearly attributed it to others. You must not use the work of others without proper citation. And, you must not use resources, including other persons, except as authorized by the course or project for which you are submitting the work. Such conduct might be accepted or commonplace elsewhere, but it is not here. Be careful. Be warned. Failure to abide by these rules, even just once, can result in your permanent separation from the University without refund of monies paid. Note that the policy requires the student to be informed and understand the academic integrity rules for every assignment or exam in a course.

The MCDS program strives to produce graduates with the highest standards of academic integrity. Academic Integrity Violations are taken very seriously and the MCDS program has a zero tolerance policy for multiple Academic Integrity Violations; students who commit more than one academic integrity violation will be immediately dismissed from the program.

3.3.27 Teaching Assistants
The MCDS degree does not have a teaching requirement. However, some students may wish to be a teaching assistant. MCDS students may petition for approval to TA up to one course per semester provided that they are in good academic standing (Overall QPA 3.0 or above).

As required by the English Fluency in Higher Education Act of 1990, graduate students are required to have a certain level of fluency in English before they can instruct in Pennsylvania. Through this Act, all institutions of higher education in the state are required to evaluate and certify the English fluency of all instructional personnel, including teaching assistants and interns.
The full university policy can be reviewed at: http://www.cmu.edu/policies/faculty/evaluation-certification-english-fluency-instructors.html.

In addition to administering the International Teaching Assistant (ITA) Test (a mandatory screening test for any non-native speaker of English may be required), the Intercultural Communication Center (ICC) helps teaching assistants who are non-native English speakers develop fluency and cultural understanding to teach successfully at Carnegie Mellon. Visit the ICC website for additional information: www.cmu.edu/icc.

3.3.28 Internship Requirement and Search for Full Time Employment
An internship is required for the degree program. In some cases, when a student has prior work experience, the Director of the degree program may waive this requirement. Students start searching for internships generally in the Fall and Spring semesters. Once the student returns from an internship in the Fall, they should immediately begin the search for full time employment. Extensive resources are available at http://www.cmu.edu/career/ including a resume submission system, a list of employers, on campus interviews and mock interviews, and many other resources.

The Technical Opportunities Conference (TOC) http://engineering.cmu.edu/companies/toc/ occurs every September. This conference is one of the main recruiting events each year.

All international students are required to apply for Curricular Practical Training (CPT). CPT is employment that is an integral part of an established curriculum and is directly related to the student’s major area of study. Please visit the Office of International Education (OIE) link below to learn more about the CPT process: http://www.cmu.edu/oie/forstu/jobs.html

3.4 Enrollment Verification
http://www.cmu.edu/hub/transcripts/verifications/enrollment.html
Enrollment Services is the only University office that can provide an official letter of enrollment, official transcript and enrollment verification. Enrollment verification can be requested online through The HUB via the provided link.

3.5 Assistance for Individuals with Disabilities
The Office of Disability Resources at Carnegie Mellon University has a continued mission to provide physical and programmatic campus access to all events and information within the Carnegie Mellon community. We work to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Sections 503 and 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations must submit a Voluntary Disclosure of Disability Form to access@andrew.cmu.edu to begin the interactive accommodation process. For more information please see http://www.cmu.edu/hr/eos/disability/index.html. Students with disabilities are encouraged to self-identify with Equal Opportunity Services by contacting Larry Powell, 412-268-2013, lpowell@andrew.cmu.edu to access the services available at the university and to initiate a request for accommodations.
3.6 University Policies on Grades and Grading

3.6.1 University Policy on Grades
http://www.cmu.edu/policies/documents/Grades.html
This policy offers details concerning university grading principles for students taking courses and covers the specifics of assigning and changing grades, grading options, drop/withdrawals and course repeats. It also defines the undergraduate and graduate grading standards.

3.6.2 University Policy on Grades for Transfer Courses
http://www.cmu.edu/policies/documents/TransferCredit.html
Carnegie Mellon University offers students the opportunity to take courses for credit through a cross-registration program (see Pittsburgh Council on Higher Education (PCHE) and Cross-registration below) and through the receipt of transfer credit from other accredited institutions.

The Carnegie Mellon University transcript will include information on such courses as follows: Carnegie Mellon courses and courses taken through the university's cross-registration program will have grades recorded on the transcript and be factored into the QPA. All other courses will be recorded on this transcript indicating where the course was taken, but without grade. Such courses will not be taken into account for academic actions, honors or QPA calculations. (Note: Suspended students may take courses elsewhere; however, they may receive transfer credit only if their college and department policies allow this.)

3.7 Academic Integrity
http://www.cmu.edu/academic-integrity/
In the midst of self-exploration, the high demands of a challenging academic environment can create situations where some students have difficulty exercising good judgment. Academic challenges can provide many opportunities for high standards to evolve if students actively reflect on these challenges and if the community supports discussions to aid in this process. It is the responsibility of the entire community to establish and maintain the integrity of our university.

Carnegie Mellon University educates its students to become professionals who will serve society with integrity. The university also creates and disseminates new knowledge and expressions of knowledge in ways that benefit society. Carnegie Mellon strives to serve the changing needs of society through the three primary goals outlined in its mission statement: to create and disseminate knowledge and art through research and artistic expression, teaching and learning and transfer to society, to serve students by teaching them leadership and problem-solving skills, and the values of quality, ethical behavior, responsibility to society and commitments to work, to pursue the advantages provided by a diverse community, open to the exchange of ideas, where discovery and artistic creativity can flourish.

In any presentation, creative, artistic or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.
The university has a very clear and specific protocol for responding to alleged violations of academic integrity. Carnegie Mellon's Academic Disciplinary Actions Overview for Graduate Students describes procedures and the appeal process for disciplinary actions against graduate students in cases of alleged academic integrity violation.

For more information please see: http://www.cmu.edu/academic-integrity/documents/academic-disciplinary-actions-overview-for-graduate-students.2013.pdf.

**Important Note:** The LTI implements the above policy’s option of “conven[ing] a disciplinary hearing according to the procedures of the department/program”. We have adopted a “two strikes” rule: while we may expel students upon a first violation, we **always** expel them for a second violation, with no exceptions.

### 4 Academic Policies

#### 4.1 MCDS Academic Policies

**4.1.1 Duration of Study**

MCDS students enrolled for full-time studies are normally expected to complete the degree in three semesters (16 months). This includes a summer internship.

**4.1.2 Double-Dipping**

A Masters student who uses courses taken as part of another degree program (at Carnegie Mellon or elsewhere) toward their program requirements cannot use those same courses toward any other M.S. degree offered by the School of Computer Science without prior approval.

**4.1.3 Pass/Fail Grades**

Pass/fail grades are not permitted for courses used to satisfy a degree requirement. Graduate students who are required to take additional undergraduate courses to build up the core foundations of computer science may not elect the pass/fail option for these courses.

**4.1.4 Transfer Credit**

An equivalent graduate course previously completed at another institution may be permitted to satisfy one of the MCDS course requirements, with permission from the Director. Students must petition for transfer credit by providing the Program Director with the prior course syllabus and other details that may be required by the Director in order to make a decision. See the section on “Definition of transfer credit versus course exemption”.

All MS students are required to take a minimum of 96 units of coursework at CMU.

**4.1.5 External Internships and Job Interviewing**

MCDS students are expected to attain an external internship during the summer. International students must coordinate carefully with the LTI, due to visa restrictions. International students must also have approval in advance from the Office of International Education (OIE).
We caution all students to be aware of potential intellectual property (IP) problems with internships, and to review any IP agreements with their advisors before signing them. It is possible to lose ownership of your ideas.

While it is necessary for students to travel off-campus for job interviews, it is not acceptable for a student to miss a course requirement or a capstone project commitment due to interview travel. Students should work proactively with prospective employers to arrange interview travel in a way that minimizes the impact on their final semester course work.

4.1.6 Transferring Into the MCDS Program
Direct transfers into the MCDS program are not permitted. Students who are currently enrolled at Carnegie Mellon who wish to transfer into the MCDS program must do so by applying to the MCDS program via the normal admissions process. As specified elsewhere in this document, some transfer credit and/or exemption from MCDS requirements may be possible on a case-by-case basis.

4.1.7 Transferring Out of the MCDS Program
The MCDS program does not prevent students from transferring to another degree program. Each degree program has its own rules about whether and when transfers into the program are permitted. A student that is interested in transferring out of the MCDS degree program should consult the handbook and Program Director of the desired degree program to learn whether transfers are permitted, and if so, how and when to request such a transfer.

4.1.8 Statute of Limitations
All units required for the Masters degree, whether earned in residence or transferred from another institution, must be recorded on the transcript within seven years of the date on which the student enrolled in the program (CMU policy), or less if required by a more restrictive department, school or college policy. The SCS Associate Dean for Graduate Education can extend this statutory period for special circumstances that do not make it possible for the student to complete the requirements within the statutory period. The SCS Associate Dean for Graduate Education must approve by the Department Head and any request for a waiver of the statute of limitations for the Masters degree. The waiver request must explain the exceptional circumstances that warrant an extension. For cases in which a waiver is granted, the waiver will cover specific courses and will specify a time period for completion of the program.

4.2 LTI Academic Policies

4.2.1 “Grandfather” policy
A student can graduate under the policies in effect at the time that the student entered the program; or, at the student’s choice, the student can graduate under policies that are adopted after the student entered the program. In unusual cases, the Director may approve exceptions to the program requirements.

4.2.2 Course Drop/Add procedures
Please consult the Official Academic Calendar for official add/drop dates at:
4.2.3 Courses with restricted enrollment
MCDS students have priority for the program core courses. The MCDS program administrators cannot intercede with other departments to secure seats for its students in other courses as all departments reserve seats for their accepted students. Usually all remaining open seats are assigned on a first- come, first-served basis. Students can, on occasion, contact the assigned course instructor in order to plead his/her case for admission to the course. Admission may be granted at the discretion of the instructor. The policy of the department offering the course(s) is always followed.

4.2.4 Definition of transfer credit versus course exemption
The LTI may grant transfer credit or issue an exemption for equivalent graduate courses previously completed at another institution. This decision rests with the chair of the particular program. If a student is exempt from a required course due to prior courses or experience, the student can replace that course with an open elective. The student does not receive credit for the external course, but can take any course that could normally count toward the degree in its place. If a student receives credit for prior coursework completed at CMU or elsewhere, the student receives that many units of credit, and the total amount of required coursework is reduced by that amount.

4.2.5 External Employment/Consulting
Since the MCDS program places heavy demands on student time, external employment and/or consulting are strongly discouraged. Exceptional students who wish to consult should discuss this with their Advisor. International students must also have approval in advance from the Office of International Education (OIE) for any outside employment.

4.2.6 Leave of Absence
The LTI discourages Leaves of Absence (LOA), since students usually do not return, despite good intentions. However, a student in good standing may be granted a LOA of at most 1 year, upon written request to the Program Director and with consent of the student’s advisor. It is the responsibility of the student on LOA to contact the LTI to initiate a return to the program.

4.2.7 Satisfactory Progress
If a student does not make satisfactory progress each semester toward completing the degree, the LTI may remove the student from the program. See section on “End of Semester Evaluation”. In particular, students in the three-semester program who fail one of their first-semester MCDS core required courses are strongly encouraged to consider switching to the four-semester program.

4.2.8 Winter and Summer Breaks
Students supported by research projects or working in an on-campus internship are expected to remain on campus working during breaks in classes. A two-week vacation is typically allowed in the summer. The normal winter break policy is that the student works 40 hours per week for two weeks, and takes vacation for the other two weeks.

http://www.cmu.edu/hub/calendar.html
4.3 CMU Academic Policies

4.3.1 Assistance for Individuals with Disabilities
The Office of Disability Resources at Carnegie Mellon University has a continued mission to provide physical and programmatic campus access to all events and information within the Carnegie Mellon community. We work to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Sections 503 and 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations must submit a Voluntary Disclosure of Disability Form to access@andrew.cmu.edu to begin the interactive accommodation process.

For more information please see http://www.cmu.edu/hr/eos/disability/index.html. Students with disabilities are encouraged to self-identify with Equal Opportunity Services by contacting Larry Powell, 412-268-2013, lpowell@andrew.cmu.edu to access the services available at the university and initiate a request for accommodations.

4.3.2 Summary of Graduate Student Appeal and Grievance Procedures
Graduate students will find the Summary of Graduate Student Appeal and Grievance Procedures on the Graduate Education Resource webpage. This document summarizes processes available to graduate students who seek review of academic and non-academic issues. Generally, graduate students are expected to seek informal resolution of all concerns within the applicable department, unit or program before invoking formal processes. When an informal resolution cannot be reached, however, a graduate student who seeks further review of the matter is to follow the formal procedures outlined here. These appeal and grievance procedures shall apply to students in all graduate programs of the University. Students should refer to the department specific information in this handbook for department and college information about the administration and academic policies of the program. Additionally, students may confer with the graduate student ombudsman, Suzie Laurich-McIntyre, slaurichmcintyre@cmu.edu, on issues of process or other concerns as they navigate conflicts.

4.3.3 Safeguarding Educational Equity: Sexual Harassment and Sexual Assault
Sexual harassment and sexual assault are prohibited by CMU, as is retaliation for having brought forward a concern or allegation in good faith. The policy can be viewed in its entirety at: http://www.cmu.edu/policies/documents/SA_SH.htm. If you believe you have been the victim of sexual harassment or sexual assault, you are encouraged to make contact with any of the following resources:
- Sexual Harassment Advisors, found in appendix A of the Policy Against Sexual Harassment and Sexual Assault;
- Survivor Support Network, found in appendix B of the Policy Against Sexual Harassment and Sexual Assault;
- Sexual Harassment Process and Title IX Coordinators, found in section II of the Policy Against Sexual Harassment and Sexual Assault;
- University Police, 412-268-2323;
- University Health Services, 412-268-2157;
- Counseling & Psychological Services, 412-268-2922.
4.3.4 Maternity Accommodation Protocol
Students whose anticipated delivery date is during the course of the semester may consider taking time away from their coursework and/or research responsibilities. All female students who give birth to a child while engaged in coursework or research are eligible to take either a short-term absence or formal leave of absence. Students in course work should consider either working with their course instructor to receive incomplete grades, or elect to drop to part-time status or to take a semester leave of absence. Students engaged in research must work with their faculty to develop plans for the research for the time they are away.

Students are encouraged to consult with relevant university faculty and staff as soon as possible as they begin making plans regarding time away. Students must contact the Office of the Dean of Student Affairs to register for Maternity Accommodations. Students will complete an information form and meet with a member of the Dean’s Office staff to determine resources and procedures appropriate for the individual student. Planning for the student’s discussion with her academic contact(s) (advisor, associate dean, etc.) will be reviewed during this meeting.

5 Financial Issues

5.1 Tuition

5.1.1 Tuition payments
To understand your invoice, payment options, etc., visit: http://www.cmu.edu/hub. The MCDS program sets tuition each year for all students in the program. The student must handle tuition problems by contacting The Hub. The MCDS Program Administrators cannot solve tuition problems.

5.1.2 Sponsored Students
A sponsored student is one who has another party (such as an embassy or company) who has agreed to pay the student’s tuition. Please read the “Sponsored Students” section.

5.1.3 Employer Reimbursement Process
If you have an employer reimbursement plan, write your employer’s name and address on the bill (or provide CMU with a letter of support) and pay at least one-third of the tuition charge when returning the bill. You must pay previous semester balances before you can enroll for the next semester.

5.1.4 Carnegie Mellon employee reimbursement procedure
Contact the Benefits Office for specific information on tuition benefits. You must complete a Tuition Remission Form each semester in order to receive these benefits. To receive a Tuition Remission Form, visit the Human Resources website at: http://www.cmu.edu/hr.

5.1.5 Financial aid, tuition waivers, Scholarships
The MCDS degree program does not provide financial aid to graduate students, nor does it provide tuition waivers or scholarships. For complete financial aid information see:
http://www.cmu.edu/finaid/basics/graduate/. The Financial Aid Office of Carnegie Mellon will provide assistance in completing the necessary paperwork to apply for Stafford loans.

5.1.6 External fellowships
The MCDS program will accept students with external fellowships.

5.1.7 Grade Reports
Grade reports are mailed to individual students by the university at the conclusion of each semester. See the official calendar for mailing dates.

5.1.8 Late Graduation
On occasion, a student and/or his/her employer may request that the student attend Carnegie Mellon for an additional semester in order to complete a program that will be beneficial to both the student and the employer. Under such circumstances late graduation can be arranged. Student is to discuss his/her situation with the Director.

5.1.9 Deferment of start of program
An applicant who is admitted into the MCDS program is eligible to enter the program in the year of admission. If a deferment is requested and granted, the student is eligible to enter in the following year. Only one deferment will be granted to each student. If a student does not attend in the year following admission, the student must re-apply to the program.

5.2 Conference Travel Funding
Students funded by a research project may receive travel funding according to policies set by the individual projects. Students who have no project funding may be provided with partial funding, with a larger amount available for travel to present a refereed conference paper. There is an LTI form that must be filled out in advance.

5.3 Expenses
The program will reimburse any expenses incurred on behalf of the MCDS program if approved by the Director. Please receive approval before purchase. Verification of purchase and/or expenses along with receipts is to be presented to the program administrator for reimbursement.

5.3 Health insurance
http://www.cmu.edu/policies/documents/StudentInsurance
Carnegie Mellon has a Student Health Insurance policy requiring full-time, degree-seeking students to carry adequate medical insurance. Students must either purchase the plan offered by the University or an application for a waiver can be made if the student is “enrolled as the dependent, partner/spouse or principal in an employer or government-sponsored insurance plan”. It is the responsibility of each student to make arrangements with Student Health Services to either pay for their insurance at the beginning of the semester, or elect a payment plan over the course of the academic year. More information is available at the Student Health Services Web site www.studentaffairs.cmu.edu/HealthServices/insurance.
5.4 Emergency Loans

http://www.cmu.edu/student-affairs/index.html

All students regardless of their program are eligible for the Emergency Student Loan, which is an interest-free and emergency based loan repayable within 30 days. It is available through the Office of the Dean of Student Affairs; students may apply for the loan by stopping in to the Student Affairs Office, Warner Hall 301, or by calling (412) 268-2075 for an appointment.

6 Additional University Resources

6.1 The HUB Student Services Center

thehub@andrew.cmu.edu and http://www.cmu.edu/hub/

The HUB is located in Warner Hall, Lower Level. The HUB staff delivers comprehensive service and counsel to students and families regarding financial aid, billing and payment, registration and academic records. The Assistant Directors in The HUB serve as contacts for specific colleges and assist enrolled students with key aspects of the enrollment process. Student can find their assigned HUB Assistant Director on their Student Information Online (SIO) Resource page. Questions that need specialized, in-depth attention can be directed to the student’s assigned Assistant Director. For general questions and information, students may email The HUB or call 412-268-8186.

6.2 Student Information Online (SIO)

Student Information Online (SIO) is a secure site where students can find important, personalized information, including E-Bills and student account information, financial aid status and eligibility, grades and QPA, and course schedules. Students can update their and their spouse's or domestic partner's contact information, sign up for E-Check & E-Refund, authorize their spouses, domestic partners or other individual to receive a copy of their E-Bill, request verifications, view their housing and meal plan assignments, and much more. Students can log on to SIO by going to www.cmu.edu/hub/sio and entering their Andrew User ID and password.

On SIO, students will designate an emergency contact address of a relative or family friend to be contacted in the case of an emergency. If students do not want their name and address published in the campus directory, they must notify the HUB in writing.

6.3 ID Cards

Graduate students can obtain their ID card from The HUB once they have been entered into SIO for the semester. These cards identify their holders as members of the campus community. Student cards are deactivated upon the cardholder’s separation from the university.

Affiliate ID Cards are available for spouses and partners of graduate students that allow them to access Carnegie Mellon’s campus. These cards are available through The HUB to spouses and partners of graduate students who are enrolled for the current academic year in a full-time graduate degree program. The card is valid for one year. For information about domestic partner registration, visit the Office of the Dean of Student Affairs webpage: http://www.studentaffairs.cmu.edu/dean/domestic_partner/.
For more information about student and affiliate ID cards (spouse, domestic partners and dependent children), please visit: http://www.cmu.edu/idplus/idcards/cardtypes.html.

6.4 Transcripts
Information about and instructions for ordering transcripts are available at: www.cmu.edu/hub/transcripts.html. Transcript questions may be directed to esg-transcripts@andrew.cmu.edu.

6.5 Pittsburgh Council on Higher Education (PCHE) and Cross-registration
http://www.cmu.edu/policies/documents/CrossRegister.html
Cross-registration provides an opportunity for enriched educational programs by permitting full-time graduate students to cross-register for courses (usually no more than one per semester) at Pittsburgh Council on Higher Education (PCHE) Institution. Full-time Carnegie Mellon degree students are eligible and the PCHE course may not count towards full-time status unless the student is enrolled in an inter-university program. Students interested in taking advantage of this opportunity should be familiar with the Policy on Grades for Transfer Courses already outlined previously in this handbook. Department specific information about graduate students’ ability to cross-register and transfer grades should be included here.

6.6 Student Privacy Rights and FERPA
http://www.cmu.edu/policies/documents/StPrivacy.html
This university policy notifies students of their rights under the federal Family Educational Rights and Privacy Act (FERPA). According to FERPA, students have the right to:
- Inspect and review their education records;
- Request an amendment to their education record if they believe they are inaccurate or misleading;
- Request a hearing if their request for an amendment is not resolved to their satisfaction;
- Consent to disclosure of personally identifiable information from their education records, except to the extent that FERPA authorizes disclosure without consent;
- File a complaint with the U.S. Department of Education Family Policy Compliance Office if they believe their rights under FERPA have been violated.
For questions about Student Privacy Rights, FERPA or filing a complaint, contact John Papinchak, University Registrar, jp7p@andrew.cmu.edu, in Enrollment Services.

6.7 Academic Calendar
The official academic calendar is published by Enrollment Services. It is not uncommon for departments and colleges to have academic requirements that differ from or are in addition to those presented in the academic calendar provided to the campus community by Enrollment Services: www.cmu.edu/hub/calendar.html.

6.8 Professional Development
http://www.studentaffairs.cmu.edu/career/index.html
The Career and Professional Development Center (CPDC) at Carnegie Mellon is a centralized career center staffed by a team of seasoned and highly educated professionals who
orchestrate the career exploration, experiential learning, and career networking needs of students and alumni.

CMU's career and professional development model is grounded in discipline-specific career development, experiential learning, and employer relations shaped by strong connections with the university's seven academic colleges. The center's success is founded upon a solid understanding of career and professional development theory, integration of technology, and an unwavering commitment to providing personalized attention towards meeting the unique individual needs of students, alumni, and employers. The CDPC is located on the Lower Level of the University Center, 412-268-2064.

The Office of the Assistant Vice Provost for Graduate Education (AVPGE) offers a robust schedule of professional development opportunities. Some are geared towards a specific population (master’s students, PhD students at the beginning of their program, graduate students seeking tenure track positions, etc.) and others are open to all graduate students (time management, balancing, staying healthy). A full schedule of programs can be found at: http://www.cmu.edu/graduate/.

6.9 University Libraries
http://search.library.cmu.edu
There are three main libraries at Carnegie Mellon: Hunt Library, Mellon Institute Library and Engineering & Science Library with the combined mission of providing access and help to graduate students in finding the information needed, teaching graduate students to evaluate available information and use reliable sources. The libraries’ digital resources and services, including off-campus/ wireless access to databases and e-journals, offer online access. There are also two neighboring libraries open to Carnegie Mellon graduate students: Carnegie Library of Pittsburgh and University of Pittsburgh Libraries. Visit the University Libraries website for information about all mentioned library locations and hours, on-line resources and FAQ’s.

6.10 Computing Services
http://www.cmu.edu/computing/
Computing Services is located in Cyert Hall 285. Computing Services develops, maintains and supports the computing infrastructure for Carnegie Mellon students, faculty members and staff members. This includes the campus wired and wireless networks, public computer labs or “clusters,” cable television and telephone services, computing related documentation and support through the Help Center. In addition, Computing Services provides standard classroom technologies for over 100 lecture halls, classrooms and seminar rooms across campus. The website contains additional information regarding The Help Center hours, location and contact information, computing cluster hours and location, the Carnegie Mellon web portal, computing security and policies and guidelines. Students can email the Help Center at advisor@andrew.cmu.edu with questions and for assistance.

6.11 Family and Dependents Resources
http://www.cmu.edu/stugov/gsa/resources/family.html
The Graduate Student Assembly website maintains a resource page for spouses, domestic partners and families of graduate students, including The Student Parent Association, new
mother rooms, and links to resources around campus and the Pittsburgh area.

Affiliate ID Cards are available for spouses and domestic partners of graduate students that allow them to access Carnegie Mellon’s campus. These cards are available through The HUB to spouses and partners of graduate students who are enrolled for the current academic year in a full-time graduate degree program. The card is valid for one year.

For more information about student and affiliate ID cards, please visit: http://www.cmu.edu/idplus/idcards/cardtypes.html.

6.12 Domestic Partner Registration
http://www.studentaffairs.cmu.edu/dean/domestic_partner/index.html
Carnegie Mellon extends certain benefits to domestic partners of students. Eligible students may elect benefits for their domestic partners through the registration process orchestrated by the Office of the Dean of Student Affairs, located on the 3rd floor of Warner Hall. See the website for information regarding the benefits available for domestic partners, eligibility for domestic partner benefits, registration instructions and forms.

6.13 Housing
www.cmu.edu/housing/community-housing/index.html
The University does not currently offer housing to graduate students. The Office of Housing and Dining Services does provide community housing information to assist graduate students who are seeking housing in the communities surrounding the university, including information on the legal aspects of renting an apartment, moving checklists and the off-campus housing database.

6.14 Dining
http://www.cmu.edu/dining/
Dining services and operations are offered through the Office of Housing and Dining Services. The office operates dining locations open around campus in academic buildings, Hunt Library and the University Center. These locations offer flexible hours with options from the early morning through late night. The Dining Service website contains information about dining locations, hours of operation, graduate student dining plans forms, nutritional information, and weekly menus for dining locations.

6.15 Parking and Transportation
http://www.cmu.edu/parking/
Graduate students will find information about parking and availability, parking policies, transportation options and Port Authority Transit usage with a valid university ID on the Parking and Transportation Services site. The Parking and Transportation Services office is located in the lower level of the University Center, LL#8. There is limited parking on campus and the varying permit rates can be found on the website. All parking areas of campus are either by permit, metered or by the hour in the garage. Parking and Transportation Services will ticket any car parked in a permit area without a permit or at an expired meter. The city monitors the metered parking along Margaret Morrison, Frew and Tech Streets and will ticket at expired meters as well.
The University offers shuttle and escort services operated through University Police. The Shuttle Service operates several routes within Oakland, Squirrel Hill and Shadyside areas, as well as to University sites located outside of the main campus. The Escort Service offers vehicle routes within a radius of campus between 6:30 pm-6 am daily. Information regarding up-to-date shuttle and escort schedules, pick-up/drop-off locations, routes and usage policies can be found at: www.cmu.edu/police/shuttleandescort/.

SafeWalk provides another option to campus community members walking across and around campus during late-night hours. SafeWalk is a student volunteer organization that provides campus escorts for all members of the Carnegie Mellon community. SafeWalk operates nightly during the regular academic year (except certain holidays and break periods) from 10pm until 2am. Students, faculty and staff may request an escort by calling 412-268-SAFE (8-7233 from a campus phone), by approaching an escort team, or by stopping by the SafeWalk dispatch area in the University Center, Lower Level near the Post Office Package Pick-Up window between 10pm-2am. SafeWalk will escort to locations approximately one mile from campus. Additional SafeWalk information can be found at: www.studentaffairs.cmu.edu/safewalk.

6.16 Copying, Printing and Mailing Services

Carnegie Mellon offers community members easy access to FedEx, copy centers, printing and mailing services, and postal services. More information regarding these services, locations and contact information can be found at the provided link.

6.17 University Center

http://www.cmu.edu/university-center
The University Center is a centerpiece of the campus that provides a space for special events, physical fitness, student organizations and various activities, as well as accommodating retail and dining services. As the campus crossroads, the University Center functions as a place for students to interact, get involved and enjoy new experiences. Visit the University Center website for information about campus eateries, ATMs and PNC Bank, fitness rooms and schedules, retail stores, scheduling University Center space, the public prayer room, student organizations and the Wright-Rogal Chapel.

The University Center Information Desk is the location if you want to know about upcoming campus events or have questions about Carnegie Mellon in general, call the Information Desk at 412-268-2107. The Information Desk not only provides information about campus events, but also sells postage stamps, makes copies, sends faxes, distributes campus maps, manages a lost & found, and has information brochures about Pittsburgh and the campus.

6.18 Athletic/Fitness Facilities

http://www.cmu.edu/athletics
For the participant or the spectator, Carnegie Mellon offers intercollegiate athletics, intramural sports, physical education classes and club sports. The Athletics Department also offers aerobics classes in the University Center and Skibo Gym as well as occasional workshops and instruction related to fitness and health. The Athletics Office is located in the Skibo
Gymnasium.

Skibo Gym facilities include courts for basketball, volleyball, badminton, as well as weight-training and aerobic equipment. The University Center’s recreational facilities include an eight-lane pool, racquetball and squash courts, aerobics room, fitness center and gym for basketball and volleyball. All users must present a current Carnegie Mellon Card to use these facilities.

6.19 CMU Alert
http://www.cmu.edu/alert
CMU Alert sends voice and/or text messages to registered phones in the event of a campus emergency that threatens public safety or during tests of the system in the Spring and Fall semesters. Students can register for CMU Alert through the web site.

6.20 Accidents on CMU property
Please report all accidents to Jim Skees (skees@cs.cmu.edu) and the MCDS program administrator. You will be asked to complete an accident report. By reporting accidents, the student helps minimize future harm! Serious accidents and accidents taking place elsewhere on campus should be reported to Campus Police, x8-6232 (non-emergency), x8-2323 (emergency).
A. Highlighted University Resources for Graduate Students

A.1 Key Offices for Graduate Student Support

A.1.1 Office of the Assistant Vice Provost for Graduate Education

Web: http://www.cmu.edu/graduate  Email: grad-ed@cmu.edu

The Office of the Assistant Vice Provost for Graduate Education, AVPGE, directed by Suzie Laurich-McIntyre, Assistant Vice Provost for Graduate Education, provides central support for graduate students in a number of roles. These include: being an ombudsperson and resource person for graduate students as an informal advisor; resolving formal and informal graduate student appeals; informing and assisting in forming policy and procedures relevant to graduate students; and working with departments on issues related to graduate students and implementation of programs in support of graduate student development.

The Office of the AVPGE often partners with the division of Student Affairs to assist graduate students with their Carnegie Mellon experience. Senior members of the student affairs staff are assigned to each college (college liaisons) and are often consulted by the Assistant Vice Provost for Graduate Education and departments on an individual basis to respond to student needs.

The Office of the Assistant Vice Provost for Graduate Education (AVPGE) offers a robust schedule of professional development opportunities. Some are geared towards a specific population (master's students, PhD students at the beginning of their program, graduate students seeking tenure track positions, etc.) and others are open to all graduate students (time management, balancing, staying healthy). A full schedule of programs can be found at: http://www.cmu.edu/graduate/.

The Office of the AVPGE also coordinates several funding programs, seminars and workshops that advise, empower and help retain all graduate students, particularly graduate students of color and women in the science and technical fields. The fundamental goals of our programs have been constant: first, to support, advise and guide individual graduate students as they work to complete their degrees; second, to contribute to the greatest degree possible to the diversification of the academy. Visit the Graduate Education website for information about:

- Conference Funding Grants
- Graduate Small Project Help (GuSH) Research Funding
- Graduate Student Professional Development: seminars, workshops and resources
A.1.2 Office of the Dean of Student Affairs

http://www.cmu.edu/student-affairs/index.html

The Office of the Dean provides central leadership of the metacurricular experience at Carnegie Mellon. The offices that fall under the division of Student Affairs led by Vice President and Dean of Student Affairs Gina Casalegno, include (not an exhaustive list):

- Career and Professional Development Center
- Cohon University Center
- Counseling & Psychological Services (CAPS)
- Dining/Housing Services
- Office of Integrity and Community Standards
- Office of International Education (OIE)
- Student Activities
- University Health Services

Graduate students will find the enrollment information for Domestic Partner Registration and Maternity Accommodations in the Office of the Dean of Student Affairs and on the website. The Office of the Dean of Student Affairs also manages the Emergency Student Loan (ESLs) process. The Emergency Student Loan service is made available through the generous gifts of alumni and friends of the university. The Emergency Student Loan is an interest-free, emergency-based loan repayable within 30 days. Loans are available to enrolled students for academic supplies, medication, food or other expenses not able to be met due to unforeseeable circumstances. The Office of Integrity and Community Standards also provides consultation, support, resources and follow-up on questions and issues of Academic Integrity: www.cmu.edu/academic-integrity.

A.1.3 Assistance for Individuals with Disabilities

Students with disabilities are encouraged to self-identify with Equal Opportunity Services by contacting Larry Powell, 412-268-2013, lpowell@andrew.cmu.edu to access the services available at the university and initiate a request for accommodations.

A.1.4 Eberly Center for Teaching Excellence & Educational Innovation

http://www.cmu.edu/teaching

Support for graduate students who are or will be teaching is provided in many departments and centrally by the Eberly Center for Teaching Excellence & Educational Innovation. The Eberly Center offers activities for current and prospective teaching assistants as well as any graduate students who wish to prepare for the teaching component of an academic career. The Center also assists departments in creating and conducting programs to meet the specific needs of students in their programs.

Specific information about Eberly Center support for graduate students can be found at: www.cmu.edu/teaching/graduatestudentsupport/index.html.
A.1.5 Carnegie Mellon Ethics Hotline
The health, safety and well being of the university community are top priorities at Carnegie Mellon University. CMU provides a hotline that all members of the university community should use to confidentially report suspected unethical activity relating to financial matters, academic and student life, human relations, health and campus safety or research.

Students, faculty and staff can anonymously file a report by calling 877-700-7050 or visiting www.reportit.net (user name: tartans; password: plaid). All submissions will be reported to appropriate university personnel.

The hotline is NOT an emergency service. For emergencies, call University Police at 412-268-2323.

A.1.6 Graduate Student Assembly
http://www.cmu.edu/stugov/gsa/index.html
The Carnegie Mellon Student Government consists of an Executive Branch and a Legislative Branch. This is the core of traditional student government, as governed by the Student Body Constitution. The Executive Branch serves the entire student body, graduate and undergraduate, and consists of one president and four vice-presidents. The Legislative Branch for graduate students, The Graduate Student Assembly (GSA) passes legislation, allocates student activities funding, advocates for legislative action locally and in Washington, D.C. on behalf of all graduate student interests. GSA also contributes a significant amount of funding for conferences and research, available to graduate students through application processes managed by the Office of the Assistant Vice Provost for Graduate Education. GSA also plans various social opportunities for graduate students and maintains a website of graduate student resources on and off-campus, http://www.cmu.edu/stugov/gsa/Resources/. Each department has representation on GSA and receives funding directly from the GSA’s use of the student activities fee for departmental activities for graduate students. The department rep(s) is the main avenue of graduate student representation of and information back to the graduate students in the department.

A.1.7 Intercultural Communication Center (ICC)
www.cmu.edu/icc/
The Intercultural Communication Center (ICC) is a support service offering credit and non-credit classes, workshops, and individual appointments designed to equip nonnative English speakers (international students as well as international students who attended high school in the U.S.) with the skills needed to succeed in academic programs at Carnegie Mellon. In addition to developing academic literacy skills such as speaking, reading and writing, students can learn more about the culture and customs of the U.S. classroom. The ICC also helps international teaching assistants (ITAs) who are non-native English speakers develop fluency and cultural understanding to teach successfully at Carnegie Mellon and provides ITA testing, required testing indicating a nonnative speaking student has a language proficiency required before being allowed to work with undergraduates in classes, labs or individual meetings.
A.1.8 Office of International Education (OIE)

http://www.studentaffairs.cmu.edu/oie/
Carnegie Mellon hosts international graduate and undergraduate students who come from more than 90 countries. Office of International Education (OIE) is the liaison to the University for all non-immigrant students and scholars. OIE provides many services including: advising on personal, immigration, academic, social and acculturation issues; presenting programs of interest such as international career workshops, tax workshops, and cross-cultural and immigration workshops; supporting international and cultural student groups such as the International Student Union and the International Spouses and Partners Organization; maintaining a resource library that includes information on cultural adjustment, international education and statistics on international students in the United States; posting pertinent information to students through email and the OIE website, and conducting orientation programs.

A.1.9 Veterans and Military Community

http://www.cmu.edu/veterans/
Military veterans are a vital part of the Carnegie Mellon University community. Graduate students can find information on applying veteran education benefits, campus services, veteran's groups at CMU, non-educational resources and international military service information through the Veterans and Military Community website. There are also links and connections to veteran resource in the Pittsburgh community. The Naval ROTC and Veteran Affairs Offices are located at 4615 Forbes Avenue, uro-vaedbenefits@andrew.cmu.edu, 412-268-8747

A.2 Key Offices for Academic & Research Support

A.2.1 Computing and Information Resources

http://www.cmu.edu/computing
Computing Services provides a comprehensive computing environment at Carnegie Mellon. Graduate students should seek Computing Services for information and assistance with your Andrew account, network access, computing off-campus, campus licensed software, email, calendar, mobile devices, computer security, cluster services and printing. Computing Services can be reached at it-help@cmu.edu.

The Carnegie Mellon Computing Policy establishes guidelines and expectations for the use of computing, telephone and information resources on campus. The policy is supported by a number of guidelines graduate students should know. The policy and guidelines are available at: www.cmu.edu/computing/guideline/index.html.

A.2.2 Research at CMU

www.cmu.edu/research/index.shtml
The primary purpose of research at the university is the advancement of knowledge in all fields in which the university is active. Research is regarded as one of the university’s major contributions to society and as an essential element in education, particularly at the graduate level and in faculty development. Research activities are governed by several
University policies. Guidance and more general information is found by visiting the Research at Carnegie Mellon website.

A.2.3 Office of Research Integrity & Compliance

www.cmu.edu/research-compliance/index.html

The Office of Research Integrity & Compliance (ORIC) is designed to support research at Carnegie Mellon University. The staff work with researchers to ensure research is conducted with integrity and in accordance with federal and Pennsylvania regulation. ORIC assists researchers with human subject research, conflicts of interest, responsible conduct of research, export controls, intellectual property rights and regulations, and institutional animal care & use. ORIC also consults on, advises about and handles allegations of research misconduct.

A.3 Key Offices for Health, Wellness & Safety

A.3.1 Counseling & Psychological Services

www.studentaffairs.cmu.edu/counseling

Counseling & Psychological Services (CAPS) affords the opportunity for students to talk privately about issues that are significant for them in a safe, confidential setting. Students sometimes feel confused about why they are feeling upset and perhaps confused about how to deal with it. An initial consultation with a CAPS therapist will clarify options and provide a recommendation to the appropriate mental health resource at Carnegie Mellon or the larger Pittsburgh community. CAPS services are provided at no cost. Appointments can be made in person or by telephone, 412-268-2922.

A.3.2 Health Services

www.cmu.edu/HealthServices/

University Health Services (UHS) is staffed by physicians, advanced practice clinicians and registered nurses who provide general medical care, allergy injections, first aid, gynecological care and contraception as well as on-site pharmaceuticals. The CMU student insurance plan covers most visit fees to see the physicians and advanced practice clinicians & nurse visits. Fees for prescription medications, laboratory tests, diagnostic procedures and referral to the emergency room or specialists are the student’s responsibility and students should review the UHS website and their insurance plan for detailed information about the university health insurance requirement and fees. UHS also has a registered dietician and health promotion specialists on staff to assist students in addressing nutrition, drug and alcohol and other healthy lifestyle issues. In addition to providing direct health care, UHS administers the Student Health Insurance Program. The Student Health Insurance plan offers a high level of coverage in a wide network of health care providers and hospitals. Graduate students should contact UHS to discuss options for health insurance for spouses, domestic partners and dependents. Appointments can be made by visiting UHS’s website or by telephone, 412-268-2157.
A.3.3 University Police

http://www.cmu.edu/police/
412-268-2323 (emergency only)
412-268-6232 (non-emergency)
The University Police Department is located at 300 South Craig Street, Room 199 (entrance is on Filmore Street). The department’s services include police patrols and call response, criminal investigations, shuttle and escort services, fixed officer and foot officer patrols, event security, and crime prevention and education programming. Visit the department’s website for additional information about the staff, escort and shuttle, emergency phone locations, crime prevention, lost and found, finger print services, and annual statistic reports.

Carnegie Mellon University publishes an annual campus security and fire safety report describing the university's security, alcohol and drug, sexual assault, and fire safety policies and containing statistics about the number and type of crimes committed on the campus and the number and cause of fires in campus residence facilities during the preceding three years. Graduate students can obtain a copy by contacting the University Police Department at 412-268-6232. The annual security and fire safety report is also available online at www.cmu.edu/police/annualreports.

A.4 The WORD

http://www.cmu.edu/student-affairs/theword/
The WORD is Carnegie Mellon University’s student on-line handbook and is considered a supplement to the department (and sometimes college) handbook. The WORD contains campus resources and opportunities, academic policy information and resources, community standards information and resources. It is designed to provide all students with the tools, guidance, and insights to help you achieve their full potential as a member of the Carnegie Mellon community. Information about the following is included in The WORD (not an exhaustive list) and graduate students are encouraged to bookmark this site and refer to it often. University policies can also be found in full text at: http://www.cmu.edu/policies/.

- Carnegie Mellon Vision, Mission
- Carnegie Code
- Academic Standards, Policies and Procedures
  - Educational Goals
  - Academic and Individual Freedom Statement on Academic Integrity
  - Standards for Academic & Creative Life
    - Assistance for Individuals with Disabilities
    - Master’s Student Statute of Limitations
    - Conduct of Classes
    - Copyright Policy
    - Cross-college & University Registration
    - Doctoral Student Status Policy
    - Evaluation & Certification of English Fluency for Instructors
    - Final Exams for Graduate Courses
    - Grading Policies
- Intellectual Property Policy
- Privacy Rights of Students
- Research
  - Human Subjects in Research
  - Office of Research Integrity & Compliance
  - Office of Sponsored Programs
  - Policy for Handling Alleged Misconduct of Research
  - Policy on Restricted Research
- Student’s Rights
- Tax Status of Graduate Student Awards

- Campus Resources & Opportunities
  - Alumni Relations
  - Assistance for Individuals with Disabilities
  - Athletics, Physical Fitness & Recreation
  - Carnegie Mellon ID Cards and Services
  - Cohon University Center
  - Copying, Printing & Mailing
  - Division of Student Affairs
  - Domestic Partner Registration
  - Emergency Student Loan Program
  - Gender Programs & Resources
  - Health Services
  - Dining Services
  - The HUB Student Services Center
  - ID Card Services
  - Leonard Gelfand Center LGBTQ Resources
  - LGBTQ Resources
  - Multicultural and Diversity Initiatives
  - Opportunities for Involvement
  - Parking and Transportation Services
  - SafeWalk
  - Survivor Support Network
  - Shuttle and Escort Services
  - Spiritual Development
  - University Police
  - Student Activities
  - University Stores

- Community Standards, Policies and Procedures
  - Alcohol and Drugs Policy
  - AIDS Policy
  - Bicycle/Wheeled Transportation Policy
  - Damage to Carnegie Mellon Property
  - Deadly Weapons
  - Discriminatory Harassment
  - Disorderly Conduct
  - Equal Opportunity/Affirmative Action Policy
- Freedom of Expression Policy
- Health Insurance Policy
- Immunization Policy
- Missing Student Protocol
- Non-Discrimination Policy
- On-Campus Emergencies
- Pets
- Political Activities
- Recycling Policy
- Riotous and Disorderly Behavior
- Safety Hazards
- Scheduling and Use of University Facilities
- Sexual Harassment and Sexual Assault Policy
- Smoking Policy
- Student Accounts Receivable and Collection Policy and Procedures
- Student Activities Fee
- Student Enterprises
- Workplace Threats and Violence Policy
- Statement of Assurance

University policies can also be found in full text at: [http://www.cm.edu/policies/](http://www.cm.edu/policies/)
B. MCDS Major Frequently Asked Questions

B.1 MCDS Analytics Major FAQ

Class of 2016-2017

Analytics Major Advisor: Eric Nyberg, GHC 6715, 412-268-7281, ehn@cs.cmu.edu

Registration

The registration process can be completed within SIO (Student Information On-line) in four easy steps: [http://www.cmu.edu/hub/registration/docs/4-easy-steps.pdf](http://www.cmu.edu/hub/registration/docs/4-easy-steps.pdf)

1. Plan your course schedule (see “Analytics Major Requirements” and “Example Course Schedules” below)
2. Review your planned schedule with the Analytics Major Advisor (REQUIRED)
3. Check your registration time in SIO
4. Register for classes. Students register for courses starting the week of April 21st for the Fall semester. Once you have completed steps 1-3 above, you may visit the registration web site to register for your advisor-approved list of classes: [http://www.cmu.edu/hub/registration/graduates/index.html](http://www.cmu.edu/hub/registration/graduates/index.html)

MCDS Program Requirements

Students must complete 144 eligible units of study: eight 12-unit courses, two 12-unit seminar courses and one 24-unit capstone course. Students must choose at minimum 5 core courses. The remainder of the 12-unit courses with course numbers 600 or greater can be electives chosen from the SCS course catalog. Additional units taken beyond the 144 units are also considered electives. Students must maintain full-time status (min. 36 units) each semester.

MCDS Program Length

Most MCDS students complete the program in three semesters, enrolling in a minimum of 48 course units per semester. Some students opt to complete the program in four semesters, enrolling in a minimum of 36 course units per semester. The four-semester option has certain advantages, including a lower per-semester work load and the opportunity to take more classes and participate in other campus activities (hack-a-thons, contests, student club associations, work-student jobs, etc.), but this option requires an additional 4 months and increases the overall cost of the program by approximately 1/3.

Preparation Prerequisite

15-513 Introduction to Computer Systems is a prerequisite for the Analytics Major, and must be completed with a grade of "B" or better via distance education during the summer before attending CMU. This course will not be waived, even if you have used the same book and similar course material in past courses. Students who do not complete this course satisfactorily before attending CMU will be required to register for and complete the course satisfactorily in their first semester in order to remain in good academic standing.
**Wait-Lists**  [http://www.cmu.edu/hub/registration/undergraduates/waitlist.html](http://www.cmu.edu/hub/registration/undergraduates/waitlist.html)

Many courses will not clear their waitlist until the first week of classes. Do not worry about waitlists until the semester starts. We have no control over course wait-lists. We do have verbal agreements with core courses in the School of Computer Science to admit MCDS students, however we cannot guarantee admittance from wait-list when course demand exceeds capacity.

**Piazza**  [https://piazza.com/cmu/other/mcdsclassof20162017/](https://piazza.com/cmu/other/mcdsclassof20162017/)

We are using Piazza for general Q&A for the MCDS program. Please participate by reading the questions and answers other people write, as well as asking your own MCDS-related questions on Piazza whenever possible. You should already be invited and registered, or sign up using the link above. If you have a private or personal question, contact Jennifer or your advisor instead of posting on Piazza.

**Learning Objectives**

The learning objectives for the Analytics Major are arranged in a sequence to ensure that all students are adequately prepared to complete both a) a summer internship that may involve applied research, and b) a 24-unit capstone project involving applied research and development. The learning objectives are listed below, arranged by semester, with sample courses that satisfy each objective. Some of these courses are required by the Analytics Major Requirements (see below); the others are the most common choices made by current Analytics students for the given learning objective.

**Summer:**
- Demonstrate systems programming skills (15-513)

**Fall 1:**
- Apply commodity cloud computing for data science tasks (15-619)
- Apply statistical machine learning for data science tasks (10-601)
- Design, build and evaluate integrated analytic systems (11-791)
- Understand fundamental areas, tasks and challenges in data science (11-631)
- Understand how to write a technical data science publication (11-631)

**Spring 1:**
- Ability to work with real-world big data sets (10-605)
- Ability to specify, design and plan an Analytic software system (11-634)

**Fall 2:**
- Ability to develop, evaluate and deliver an Analytic software system with a corresponding technical publication (11-632)

**Analytics Major Requirements**

To be certified for graduation, all MCDS Analytics Major students must satisfy the following five (5) course requirements:
1. **Data Science Seminar** (11-631) in the Fall 1 semester
2. **Capstone Planning Seminar** (11-634) in the Spring 1 semester
3. **Data Science Analytics Capstone** (11-632) in the Fall 2 semester
4. **Core Curriculum** (5 courses)
   - Choose **2 courses in Machine Learning / Statistics**:
     ✓ 10-601 Machine Learning (Fall)
     ✓ 11-641 Machine Learning for Text Mining (Fall/Spring)
     ✓ 10-701 Advanced Machine Learning (Fall)
     ✓ 10-605 Machine Learning with Big Data Sets (Fall)
   - Choose **2 courses from Software Systems**:
     ✓ 11-791 Design and Engineering of Intelligent Information Systems (Fall)
     ✓ 15-619 Cloud Computing (Fall/Spring)
     ✓ 11-792 Information Systems Project (Spring)
     ✓ 11-642 Search Engines (Fall/Spring)
   - Choose **1 course with a focus on Big Data**:
     ✓ 15-826 Multimedia Databases and Data Mining (Spring)
     ✓ 10-605 Machine Learning with Big Data Sets (Spring)
     ✓ 11-676 Big Data Analytics (Fall)
     ✓ 11-775 Large-Scale Multi-media Analysis (Spring)
5. **Three (3) Electives in SCS**, any graduate level course 600 and above in SCS

**Example Course Schedules**

We have prepared a few example schedules with recommendations on what courses to take, including electives. You have a large amount of choice on the electives, and a fair amount of choice on the core courses, so our recommendations should be seen as suggestions, not rules or expectations. We have drafted three "prototype" analytics programs of study: "Analytics Core", "Systems & Applications Focus", and "Machine Learning Focus". These are all analytics majors, but combine choices that put the emphasis on different topics and skill sets. See the tables below and the attached table of courses (not a complete list of electives) with the mapping for these prototype suggestions. When you are choosing your own schedule, make sure that you meet the requirements listed above.

### Example 1: Analytics Core (48 units per semester)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>11-791</td>
<td>Design and Eng. of Intelligent Information Systems</td>
</tr>
<tr>
<td></td>
<td>11-642</td>
<td>Search Engines</td>
</tr>
<tr>
<td></td>
<td>10-601</td>
<td>Machine Learning</td>
</tr>
<tr>
<td></td>
<td>11-631</td>
<td>Data Science Seminar</td>
</tr>
<tr>
<td>Spring</td>
<td>11-643</td>
<td>Machine Learning for Text Mining</td>
</tr>
<tr>
<td></td>
<td>10-605</td>
<td>Machine Learning with Big Data</td>
</tr>
<tr>
<td></td>
<td>11-xxx</td>
<td>Capstone Planning Seminar</td>
</tr>
<tr>
<td></td>
<td>xx-xxx</td>
<td>Elective Course</td>
</tr>
</tbody>
</table>
Example 2: Systems and Applications Focus

| Fall 1 | 11-791 | Design and Eng. of Intelligent Information Systems |
|        | 11-642 | Search Engines                                    |
|        | 10-601 | Machine Learning                                  |
|        | 11-631 | Data Science Seminar                              |
| Spring 1 | 11-792 | Intelligent Information Systems Project          |
|         | 10-605 | Machine Learning with Big Data                    |
|         | 11-xxx | Capstone Planning Seminar                         |
|         | 15-619 | Cloud Computing                                   |
| Fall 2 | 11-632 | Data Science Analytics Capstone                   |
|         | xx-xxx | Elective Course                                   |
|         | xx-xxx | Elective Course                                   |

Example 3: Machine Learning Focus

| Fall 1 | 11-791 | Design and Eng. of Intelligent Information Systems |
|        | 11-701 | Advanced Machine Learning                         |
|        | 15-826 | Multimedia Databases and Data Mining              |
|        | 11-631 | Data Science Seminar                              |
| Spring 1 | 11-792 | Intelligent Information Systems Project          |
|         | 10-605 | Machine Learning with Big Data                    |
|         | 11-xxx | Capstone Planning Seminar                         |
|         | 11-643 | Machine Learning for Text Mining                  |
| Fall 2 | 11-632 | Data Science Analytics Capstone                   |
|         | xx-xxx | Elective Course                                   |
|         | xx-xxx | Elective Course                                   |

Program Internship Options

Students can choose to complete the MCDS Program through two possible paths. In one path, the students take a 3-month summer internship. In the other path, and if approved by industry employer and the MCDS director, students can combine their capstone project with a 7-month (summer/fall) internship, provided all other graduate requirements have been achieved. Details on the internship will be provided to you when you get to campus.
16-month / 3-semester MCDS Program with a 3-month internship

- Fall Courses
- Summer 3 mo. Internship
- Spring Courses
- Fall Capstone

16-Month / 3-semester MCDS Program with a 7-month internship

- Fall Courses
- Summer & Fall 7 mo. Internship and Capstone
- Spring Courses

20-Month / 4-semester MCDS Program with a 3-month internship

- Fall Courses
- Summer 3 mo. Internship
- Spring Courses
- Fall Courses & Capstone
- Spring Courses
20-month / 4-semester MCDS Program with a 7-month internship

Notes

1) For most 15-xxx courses, the instructor may want to know what grade you get in 15-513. Make sure to pass it with a B or better. If you skip the last few projects in 15-513, it will become impossible for you to pass the course and take any course that requires a “B” or better grade in 15-513, and you will have to retake the course in your first semester.

2) In order to enhance flexibility in the curriculum of the MCDS Analytics Major, we have changed the Capstone to a 24-unit course that you register for in your last semester. Subsequently, the 11-631 Seminar course is now a 12-unit course.

3) If a course is overfilling, the course instructor may have to make a choice between people on the wait list. You should send email to the instructor making sure they know you are in the MCDS (formerly VLIS) Analytics major being advised by Eric Nyberg, what grade you got in 15-513, and what preparation you have for taking their course.

4) All students should plan to take 10-601 Machine Learning unless they have already completed a graduate course in Machine Learning with a grade of B+ or better, in which case they may consider enrolling in 10-701 Advanced Machine Learning. 10-701 is only recommended for students with substantial course work and prior experience with machine learning.

5) 10-605 Machine Learning with Large Datasets can count for either a Machine Learning core requirement or a Big Data core requirement, but not both.

6) If you are on a wait list for a course, attend meetings, do the readings and initial homework, at least for the first 3-4 weeks. Make sure the instructor knows that you are doing this and are committed to being ready to do the course.

7) All courses start at the beginning of the semester except for courses that are intended primarily for the CSD PhD students, typically 15-7xx or 15-8xx
   ✔ For example, although the first day of classes is August 31st, 2015 the 15-719 course typically starts one week later.
Courses like 15-640 (http://www.andrew.cmu.edu/course/15-440-f14) start on the first day of classes.
If you aren't sure, and the instructor has not posted a web page with the date of the first class, or hasn't answered your email request for this date, then go to the room of the class meeting during the first week of classes to check.

8) Use your formal name for all university systems and communication.
   ✓ Make sure to use your formal (or family) name when registering on university systems.
   Do not use a nickname or an American name.
   ✓ If you have already given the wrong name to the university, please ask them to correct it as soon as you notice.
   ✓ The reason we are sharing this is that the university registration records often include names of people that are not names we find on other university records. An instructor’s registration data could say Hsi, Fu, for example, but the class roster says Hsi, Bob. Sometimes this can cause a lot of confusion especially with grade assignment.
   ✓ Your Andrew ID is unique across the university. So if your Andrew ID is username@andrew.cmu.edu, always write your Andrew ID on anything you hand into a class -- exams, reports, projects!
   ✓ It is also important to send all your outgoing email from your username@andrew.cmu.edu even if you use Gmail as your server.
   ✓ How to address people? For example, Prof. Garth Gibson’s first name is Garth and family name is Gibson. His family will call him Garth. Other people call him Mister Gibson, Doctor Gibson, Professor Gibson, or Garth. No one calls him Gibson, or Dr. Garth or Professor Garth.
B.2 MCDS Systems Major FAQ

Registration:

Students can begin to register for courses at the beginning of registration week for the fall semester. Be forewarned that some courses will not process registrations until late August – do not panic if you are placed on a waitlist. Please visit:  
http://www.cmu.edu/hub/registration/graduates/index.html

The registration process can be completed within SIO (Student Information On-line) in four easy steps.
1. Plan your course schedule
2. Review that your planned schedule complies with this document
3. Check your registration time in SIO
4. Register for classes

Learn how to complete these four easy steps.
http://www.cmu.edu/hub/registration/docs/4-steps.pdf

MCDS Program Requirements

Students must complete 144 eligible units of study. This includes eight 12-unit courses, two 12-unit seminar courses and one 24-unit capstone course. Students must choose at least 5 core courses. The remainder of the 12-unit courses with course numbers 600 or greater can be electives chosen from the SCS course catalog. Any additional non-prerequisite units taken beyond the 144 units are also considered electives. Students have to maintain full-time status in all semesters (a minimum of 36-units per semester).

Preparation Prerequisite

15-513 Introduction to Computer Systems must be completed (as a 6 unit course, online and remote) with a grade of "B" or better during the summer semester before starting at CMU in Pittsburgh. This course is required for most of the MCDS graduate courses, so not completing it before coming to campus will make it likely that you will not be able to complete the program in three semesters on campus. Newly admitted students take this course via distance education during the summer before attending CMU. This course will not be waived even if you have used the same book and similar course material in past courses.

Systems Major Program Requirements

The systems program consists of four components.
1. Core Curriculum (Pick 5, with at least 3 project courses).

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Project</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-605</td>
<td>Operating Systems Implementation</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>15-615</td>
<td>Database Applications</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-618</td>
<td>Parallel Computer Architecture and Programming</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-640</td>
<td>Distributed Systems</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-619</td>
<td>Cloud Computing</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-746</td>
<td>Advanced Storage Systems</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-719</td>
<td>Advanced Cloud Computing</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-721</td>
<td>Advanced Databases</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-826</td>
<td>Multimedia Databases and Data Mining</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-712</td>
<td>Adv. and Distributed Operating Systems</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>15-821</td>
<td>Mobile and Pervasive Computing</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>


3. Capstone project (15-649 Section C, D or E) in your last semester. Most students will take Section C on campus in their third semester.

4. Three Electives in SCS – any graduate level course 600 and above in the School of Computer Science (SCS). Here are a few examples of common elective courses:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-637</td>
<td>Web Applications</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>15-641</td>
<td>Computer Networks</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>10-601</td>
<td>Machine Learning</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>10-605</td>
<td>Machine Learning with Big Data Sets</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>10-701</td>
<td>Advanced Machine Learning</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>11-611</td>
<td>Natural Language Processing</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>11-642</td>
<td>Search Engines</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>11-641</td>
<td>Machine Learning for Text Mining</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>11-791</td>
<td>Design and Eng. of Intelligent Info Systems</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
**Wait-lists:**
Many courses will not clear their waitlist until the first week of classes. Do not worry about waitlists until the semester starts. We have no control over course waitlists. We do have verbal agreements with core courses in the School of Computer Science to admit MCDS students. However, we cannot guarantee admittance from the wait-list when course demand exceeds capacity.

Please see waitlist policy here:
[http://www.cmu.edu/hub/registration/undergraduates/waitlist.html](http://www.cmu.edu/hub/registration/undergraduates/waitlist.html)

**Piazza:**
We are using Piazza for Q&A about the MCDS program. Please participate by reading the questions and answers other people write, as well as asking your MCDS related questions on Piazza whenever possible. [https://piazza.com/cmu/other/mcdsclassof20162017/](https://piazza.com/cmu/other/mcdsclassof20162017/)

You should already be invited and registered. If not, please signup: [https://piazza.com/cmu/other/mcdsclassof20162017](https://piazza.com/cmu/other/mcdsclassof20162017)

If you have a private or personal question please contact Jennifer or your advisor instead of posting on Piazza.

**Program Duration:**

Students can choose to complete the MCDS Program through two possible paths. In one path, the students take a 3-month summer internship. In the other path, and if approved by industry employer and the MCDS director, students can combine their capstone project with a 7-month (summer/fall) internship, provided all other graduate requirements have been achieved. Details on the internship will be provided to you when you get to campus.

**16-month / 3-semester MCDS Program with a 3-month internship**
16-Month / 3-semester MCDS Program with a 7-month internship

- Fall Courses
- Summer & Fall 7 mo. Internship and Capstone
- Spring Courses

20-Month / 4-semester MCDS Program with a 3-month internship

- Fall Courses
- Summer 3 mo. Internship
- Spring Courses
- Spring Courses
- Fall Courses & Capstone

20-month / 4-semester MCDS Program with a 7-month internship

- Fall Courses
- Summer & Fall 7 mo. Internship & Capstone
- Spring Courses
- Spring Courses

Notes:
1) For most 15-xxx courses, the instructor may want to know what grade you got in 15-513. Make sure to pass it with a B or better. If you skip the last few projects in 15-513, it will
become impossible for you to pass the course and take any course that requires a “B” or better grade in 15-513 and you will have to retake the course in your first semester.

2) If a course is overfilling (15-640 is likely to have this problem), the course instructor may have to make a choice between people on the wait list. You should send email to the instructor, a week before the course starts, making sure they know you are in the MCDS Systems major being advised by Garth Gibson and Majd Sakr, the grade you got in 15-513, and what preparation you have for taking their course. Note that you will have three chances to take 15-640, for example.

What usually happens with waitlists is as follows:
- a course is not full but many students are put on the waitlist anyway, probably to give the instructor the ability to make careful choices (for example, in 15-746 all MS students are put on the waitlist to start with, then we check pre-requisites before anyone gets in)
- when an instructor is happy with admitting someone, she or he notifies the course administrator for the course being taught
- the course administrator tries to admit the student but finds either that the student is already taking more than 48 units or has a time slot conflict
- at this point there is a risk that the course administrator moves onto the next name without taking any further action; mostly however, course administrators will immediately send the student email saying "if you want in, free up the time slot or number of units asap"
- if you are lucky the course administrator and instructor will hold the seat in the class for you for a day or two, but this is not guaranteed; you should respond to these email messages quickly, even if all you say is "thank you, I'll do it tonight and reply again"

If you get on the waitlist now, do not panic and do not start sending email to the instructor expecting them to make changes now. Most instructors will not sort out the waitlist until the beginning of the course. It is a good idea to send the instructor email a week before the course starts.

3) If you are still on the waitlist for a course by the first day of classes, attend its meetings, do the readings and initial homework, for as much as the first 3-4 weeks. Make sure the instructor knows that you are doing this and are committed to being ready to do the course.

4) The systems seminar courses 15-649 Section A in the first Fall semester + 15-649 Section B in the Spring semester + 15-649 Section C in the second Fall semester form a three stage capstone in Big Data Systems, and a forum for advising MCDS Systems track students – the only students allowed into these classes. In Fall 1/Spring 1 you will attend and write reports on systems research lectures, read recent systems papers and write reports on these, and perhaps start into projects that might become capstone projects in Fall 2. In Fall 1 this is not a heavy load, though it will involve activities and communication that may be new to you.

5) The project work in 15-605, Operating System Design and Implementation, is perhaps the single most time consuming programming course you might take while at CMU. Most OS courses give their students a mostly functional OS kernel and ask for a few carefully selected changes. CMU gives you a simulator for Intel x86 instructions, a few small routines, the hardware manual and the spec for the kernel. You design and build the entire
thing in groups of two. Very good masters students, taking a 50% heavier course load than the senior division CMU undergrads, are doing quite well to get a B, and most get a C. Even with a C, we are usually pleased. However, lots of people take 15-605 with too many other courses and not enough low-level programming preparation. They do not do well, and often have trouble with their other courses. We recommend getting an A in 15-513 and 15-640 before trying 15-605. 15-605 instructors will have a concern about your preparation and course load, because its projects are such a large amount of work. You will need to persuade Prof. Eckhardt to believe that you are well enough prepared for the project that you will be able to do it while also carrying your other courses.

6) 15-619 Cloud Computing is an online project-based non-PhD course, offered every semester, teaching practical understanding and use of cloud computing. The course includes five projects which are completed on AWS and Azure. There are no regular classroom meetings, the students interact with the teaching staff either by attending recitations or by asking questions on a public forum. 15-719 Advanced Cloud Computing is an in-class PhD course, offered in the Spring, teaching research issues involved in the design and implementation of cloud computing. 15-619 and 15-719 are both core to MCDS, they are two project courses in cloud computing. 15-619 emphasizes project work and 15-719 emphasizes paper reading. Both courses can count for core or project requirements.

7) All courses start at the beginning of the fall semester except for courses that are intended primarily for the CSD PhD students, typically 15-7xx or 15-8xx.
   a) For example, although the first day of classes is typically a Monday in August, the first day of 15-7xx courses might be delayed by a week.
   b) Courses like 15-640 will start on the first day of classes.
   c) If you are not sure, and the instructor has not posted a web page with the date of the first class, or has not answered your email request for this date, then go to the room of the class meeting the first week and check.

8) Courses are numbered in a manner to identify the department that sponsors or co-sponsors a course as well as the level of the course. Here are a few that are relevant to you
   - 10- The machine learning department.
   - 15- The computer science department.
   - 11- The language technologies institute.
   - 08- The institute for software research.
   - xx-1xx and xx-2xx are lower division undergraduate.
   - xx-3xx and xx-4xx are upper division undergraduate.
   - xx-5xx and xx-6xx are masters level, although we do not count xx-5xx for MCDS credit (15-513 is a prerequisite that you must take, but not for the 144 units of credit you must complete).
   - xx-7xx and xx-8xx are PhD level courses.

9) Course Sections and Days of Week
   Some courses offer multiple sections due to the capacity of classroom sizes. The difference between sections could be the instructor, when and where the class meets. Courses could meet once, twice or more each week. Here are the designations for the day of the week for
when the course meets:
- M Monday; T Tuesday; W Wednesday; R Thursday; F Friday

10) Adding and dropping courses
CMU has a very late drop deadline. If you drop before the drop deadline date, the course does not appear on your transcript. If you drop after this date, but before the end of the semester, your transcript shows the course and a grade of "withdrawn". CMU's add deadline is early (about two weeks into the semester). Before this date, you are free to add a course through SIO if you meet the automated constraints. After this date, you may still be able to add a course, but you'll need a form to be signed by an Associate Dean. http://www.cmu.edu/hub/calendar.html

11) This comment is with respect to your course load and taking extra courses.
You may take up to 60 units per semester, or five 12 unit courses. This means you could do 180 units in three semesters if you choose. However, many students over-estimate their preparation and capacity for work. For example, most PhD students do two courses in a semester; most undergrads do three or four; and most masters students do three or four. Five courses per semester is a significantly higher load than the bulk of the (very good) students at CMU. We recommend that you register and start with five courses, but pay attention to how heavily loaded you are, and be prepared to drop a course early (if you do it late, you may simply do poorly in multiple courses) if needed. We designed the MCDS program for super-human students, so that you can finish a 144 unit masters in three semesters instead of the four semesters that normal humans should take. At the super-human work load, you will have trouble having time for research, teaching, intellectual curiosity, social interaction and probably sleep. By the way, this starts in a small way this summer with 15-513. Many students underestimate the time it takes to do this well, even if you have done it before. They fail to complete projects, fail the course, have to retake it in the fall, and can't get into many desired courses. Don't let this happen to you.

12) Use your formal name for all university systems and communication.
a) Make sure to use your formal (or family) name when registering on university systems. Do not use a nickname or an American name.
b) If you have already given the wrong name to the university, please ask them to correct it as soon as you notice.
c) The reason we are sharing this is that the university registration records often include names of people that are not names we find on other university records. An instructor’s registration data could say Hsi, Fu, for example, but the class roster says Hsi, Bob. Sometimes this can cause a lot of confusion especially with grade assignment.
d) Your Andrew ID is unique across the university. So if your Andrew ID is username@andrew.cmu.edu, always write your Andrew ID on anything you hand into a class -- exams, reports, projects!
e) It is also important to send all your outgoing email from your username@andrew.cmu.edu even if you use Gmail as your server.
f) How to address people? For example, Prof. Garth Gibson’s first name is Garth and family name is Gibson. His family will call him Garth. Other people call him Mister Gibson, Doctor Gibson, Professor Gibson, or Garth. No one calls him Gibson, or
Dr. Garth or Professor Garth.

13) We have prepared a few example schedules which include a few recommendations on what courses to take, including electives. You have a large amount of choice on the electives, and a fair amount of choice on the core courses, so our recommendations should be seen as suggestions, not rules or expectations. We have drafted four "prototype" systems programs of study: "almost analytics", "hacker heaven", "web 2.0" and "systems and applications". These are all systems majors, but with choices that put the emphasis on different topics and skill sets. See the tables below and the table of courses (not a complete list of electives) with the mapping for these prototype suggestions.

- When you are choosing your own schedule, make sure that you have at least five core courses and three project courses.
- In your first Fall semester, you need to register for 15-649A.
- In your first Spring semester, you need to register for 15-649B.

Below are a few example course schedules for the Systems Major students. Three examples are provided for the 16-month MCDS option and the last example is provided for the 20-month MCDS option. The three 16-month example schedules are listed for either “Standard”, “7-month Internship” and “Back-loaded” course load scenarios. The “Alt” column suggests alternate courses. In the “Prototype” 16-month option, we also provided suggestions of courses to drop if you found the course load to be too heavy.

<table>
<thead>
<tr>
<th>Standard 16 months</th>
<th>Hacker Heaven</th>
<th>Alt</th>
<th>Almost Analytics</th>
<th>Alt</th>
<th>Web 2.0</th>
<th>Alt</th>
<th>Sys &amp; Apps</th>
<th>Alt</th>
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<tbody>
<tr>
<td>F1</td>
<td>15-640</td>
<td></td>
<td>10-601</td>
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<td>S6</td>
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<td>15-619</td>
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<td>11-642</td>
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### 7-month Intern

<table>
<thead>
<tr>
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<th>Hacker Heaven</th>
<th>Alt</th>
<th>Almost Analytics</th>
<th>Alt</th>
<th>Web 2.0</th>
<th>Alt</th>
<th>Sys &amp; Apps</th>
<th>Alt</th>
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<tbody>
<tr>
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<td>10-601</td>
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B.3 MCDS Human-Centered Data Science Major FAQ

August 15, 2016

Preparation Prerequisites
15-513 Introduction to Computer Systems has to be completed during the summer semester with a grade of "B" or better. This course is required for most of the MCDS graduate courses, admitted students take this course via distance education during the summer before attending CMU. This course will not be waived even if you have used the same book and similar course material in past courses. This prerequisite course is not included in the total eligible units of study requirement below.

Total Eligible Units of Study Requirement
Students must complete 144 eligible units of study. This requirement includes 96 units of core and elective courses drawn from the core curriculum and electives listed below in parts 1, 2 and 3 of the curriculum. For these, students must take all 3 core courses, the statistics requirement, at least 2 courses in HCI, at least 2 approved electives (with course numbers 600 or greater), and the capstone requirement. Any additional non-prerequisite units taken beyond the 144 units are also considered electives. The 144 eligible units also include two 12-unit seminar courses and one 24-unit capstone course. Students have to maintain full-time status in all semesters (a minimum of 36-units per semester).

Core Curriculum Requirement (2 courses)
Students are required to take 3 core HCDS courses.
• 05-891 Designing Human Centered Systems (Fall or Spring)
• 10-601 Machine Learning (Fall)

Behavioral Statistics Requirement (1 courses)
Students are required to take 1 statistics requirement from the following list
• 05-816 Applied Research Methods (Fall) (guaranteed admission)
• 94-834 Applied Econometrics I & II (Fall AND Spring minis)
• 36-707 Regression Analysis (Fall)

HCI Requirement (3 courses)
Students are required to take at least 2 graduate level courses in the HCII department:
• 05-839 The Information Pipeline: Collecting Computing with Data for Interactive Systems (Spring)
• 05-821 Social Web (Fall)
• 05-823 E-Learning Design Principles and Methods (Fall)
• 05-840 Tools for Online Learning (Fall)
• 05-833 Applied Gadgets, Sensors and Activity Recognition in HCI (Spring)
• 05-836 Usable Privacy and Security (Spring)
• 05-872 Rapid Prototyping of Computer Systems (Spring)
• 05-899 Crowd Programming (Spring)
• 05-899 Special Topics in HCI: Sensemaking
• 05-899 Design of Large-scale Peer Learning Systems (Fall)
• 05-899 Learning with Peers at Massive Scale (Spring)
• 05-899 Mobile Health (Spring)
• 05-899 Psychological Foundations for Designing Impact in HCI (Spring)

Electives (2 or more courses)
Students are required to take at least 2 approved electives. Here are a few examples of elective courses:
• Any additional HCII electives or any HCII course 600 or above
• 11-643 Machine Learning for Text Analysis (Fall / Spring)
• 10-605 Machine Learning with Big Data Sets (Spring)
• 10-701 Advanced Machine Learning (Fall)
• 08-622 Network Science (Fall)
• 94-832 Business Analytics and Data Mining (Fall)
• 95-872 The Art and Science of Business Analytics (Fall)
• 15-821 Mobile and Pervasive Computing
• 15-619 Cloud Computing
• Any SCS course 600 or above
• Any other course 600 or above with approval

Capstone Requirement (3 courses)
Students are required to take the capstone sequence of three courses.
• Data Science Seminar (11-631) in the Fall 1
• Capstone Planning Seminar in Spring 1 semesters
• Data Science Analytics Capstone course (11-632) in the Fall 2 semester

Internship
Students can choose to complete the MCDS Program through two possible paths. In one path, the students take a 3-month internship. In the other path, and if approved by industry employer and the MCDS director, students can combine their capstone project with a 7-month (summer/fall) internship, provided all other graduate requirements have been achieved. Details on the internship will be provided to you when you get to campus. Note that this 7 month option is appropriate if and only if you already have employers lined up who will accept such an arrangement.

We have prepared a few example schedules that include a few recommendations on what courses to take, including electives. You have a large amount of choice on the electives, and a fair amount of choice on the core courses, so our recommendations should be seen as suggestions, not rules or expectations. See the tables below and the attached table of courses (not a complete list of electives) with the mapping for these prototype suggestions.

Here are a few example course schedules for the HCDS Major students. Each example schedule
is listed with three course load scenarios. All examples are provided for the 16-month option of the MCDS program:

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<th>Example Schedules</th>
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<td>Crowd Programming, Data Pipeline, ML for Text Analysis, DHCS</td>
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<td>Ubiquitous Computing</td>
<td>DHCS, ML, ARM</td>
<td>Data Pipeline, Rapid Prototyping, Gadgets, Usable Priv &amp; Security, Advanced ML</td>
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**How do I register for courses?**

Students register for courses during November for the Spring semester and the week of April 18th for the fall semester. The academic calendar states the explicit weeks for registration. [http://www.cmu.edu/hub/calendar.html](http://www.cmu.edu/hub/calendar.html)

Please visit: [http://www.cmu.edu/hub/registration/graduates/index.html](http://www.cmu.edu/hub/registration/graduates/index.html) for more detail about the process.

The registration process can be completed within SIO (Student Information On-line) in four easy steps.

- Plan your course schedule
- Review your planned schedule with your advisor
- Check your registration time in SIO
- Register for classes

Learn how to complete these four easy steps.

[http://www.cmu.edu/hub/registration/docs/4-easy-steps.pdf](http://www.cmu.edu/hub/registration/docs/4-easy-steps.pdf)
I registered but I am on many wait-lists. Should I panic?

Many courses will not clear their waitlist until the first week of classes. Do not worry about waitlists until the semester starts. We have no control over course wait-lists. We do have verbal agreements with core courses in the School of Computer Science to admit MCDS students however we cannot guarantee admittance from wait-list when course demand exceeds capacity.

If a course is overfilling, the course instructor may have to make a choice between people on the wait list. You should send email to the instructor making sure they know you are in the MCDS degree program, add the name of your advisor, what grade you got in the prerequisites, and what preparation you have for taking their course.

If you are on the wait list for a course, attend its classes and meetings, do the readings and initial homework, at least for the first 3-4 weeks. Make sure the instructor knows that you are doing this work and that are committed to being ready to do the course.

Please see waitlist policy here: http://www.cmu.edu/hub/registration/undergraduates/waitlist.html

How do I find out what is going on in the MCDS program?

We are using Piazza for Q&A for the MCDS program. Please participate by reading the questions and answers other people write, as well as asking your MCDS related questions on Piazza whenever possible. You should already be invited and registered.

If you have a private or personal question, please contact Jennifer or your advisor instead of posting on Piazza.

How important is 15-513?

We think very carefully about requirements and the curriculum. We also learn from experience and 15-513 has determined to be essential. For most 15-xxx courses, the instructor may want to know what grade you get in 15-513. Make sure to pass it with a B or better. If you skip the last few projects in 15-513, it will become impossible for you to pass the course and take any course that requires a “B” or better grade in 15-513 and you will have to retake the course in your first semester.

When do classes start?

Check the academic calendar. http://www.cmu.edu/hub/calendar.html

All courses start at the beginning of the semester in the Fall except for courses that are intended primarily for the CSD PhD students, typically 15-7xx or 15-8xx. In the spring all courses start at the beginning of the semester.

Incoming CSD PhD students attend a special set of lectures for one week at the beginning of the Fall semester.
If you are not sure, and the instructor has not posted a web page with the date of the first class, or has not answered your email request for this date, then go to the room of the class meeting the first week and check.

Some Other Notes that are Surprisingly Useful

- Use your formal name for all university systems and communication.
- Make sure to use your formal (or family) name when registering on university systems. Do not use a nickname or an American name.
- If you have already given the wrong name to the university, please ask them to correct it as soon as you notice.
- The reason we are sharing this information is that the university registration records often include names of people that are not names we find on other university records. An instructor’s registration data could say Hsi, Fu, for example, but the class roster says Hsi, Bob. Sometimes this can cause a lot of confusion especially with grade assignment.
- Your Andrew ID is unique across the university. So if your Andrew ID is username@andrew.cmu.edu, always write your Andrew ID on anything you hand into a class -- exams, reports, projects!
- It is also important to send all your outgoing email from your username@andrew.cmu.edu even if you use Gmail as your server.
- How to address people? For example, Prof. Jennifer Mankoff’s first name is Jennifer and family name is Mankoff. Her students call her Jen. Other people call her Professor Mankoff or Jen. No one calls her Mankoff, or Dr. Jen or Professor Jen.