AUTUMN 2017 COURSE PLANNING

• This session is intended for incoming students (students starting in Summer 2017 or Autumn 2017)

• We are currently running your course selection survey. This is a non-binding survey, but it helps the MPCS determine the final schedule for Autumn 2017. Please make sure you fill it out.

• The results of the survey will be used to pre-register you in your classes, but you will have a chance to modify your registration during registration period (the week before classes start).

• In this session, we will provide an overview of your choices for the Autumn quarter, as well as advice on things to look out for in future quarters.
THE THREE CORE COURSE REQUIREMENT

• All students in the MPCS must take three core courses before you can register for any electives. This requirement ensures that you have a sufficient foundation in core Computer Science concepts before moving on to your electives.

• NO EXCEPTIONS are made to this policy.

• Please do not try to game the system (selecting an elective on the course selection survey, asking an instructor to let you take their elective, etc.). All registrations are individually checked, and any attempt to register for an elective will just mean more work for the MPCS staff.
THE THREE CORE COURSE REQUIREMENT

• If you are a full-time student that has taken Immersion Programming and Immersion Math (or passed the placement exams), this means you will take the following in Autumn 2017:
  – 1 Core Programming class
  – 1 Core Systems class
  – 1 Core Theory class

• If you have passed Immersion Programming but not Immersion Math, you will take a Core Systems class instead of Core Theory.

• If you are a part-time student, we recommend the following:
  – If taking only one class: Core Programming
  – If taking two classes: Core Programming and either Core Systems or Core Theory.
CORE PROGRAMMING

- The goals of the Core Programming classes is to strengthen your programming skills before moving on to other classes in the MPCS.

- Many classes have Core Programming as a prerequisite, meaning that you will not be able to register for many electives until you have passed Core Programming.

- Only a few classes require a specific Core Programming class (e.g., HPC and OS require C Programming)

- You can only take one Core Programming class. You cannot take additional Core Programming classes as electives.
Core Programming

- **MPCS 51042 - Python Programming**
  Recommended for anyone who will be taking data-oriented classes (Foundations of Computational Data Analysis, Machine Learning, etc.) Also a good choice if you are coming out of Immersion Programming and you don’t have a compelling reason to choose one of the other Core Programming classes.

- **MPCS 51043 - Swift Programming**
  Recommended for anyone who will be taking iOS classes.
**Core Programming**

- **MPCS 51040 - C Programming**
  Recommended for anyone who is interested in learning more about the low-level aspects of computer systems and of programming. More challenging than Python and Swift.

- **MPCS 51100 - Advanced Programming**
  Taught in C. Designed to be a challenging class for students who already have a degree in Computer Science. If you are in Immersion Programming, and are looking for a challenge, *do not* take this class; take C Programming instead.
CORE PROGRAMMING

• **If I don’t take Python Programming, will I still be able to take classes that require Python?**

The MPCS classes that require knowledge of Python do not have Python Programming as a prerequisite. However, if you did not take Python Programming, you will have to pick up Python on your own. The MPCS also offers a Python Workshop in the Winter. Any students who has done well in Core Programming (in any language) should be able to pick up Python easily.

• **Do I need to take Swift Programming to take iOS Programming?**

If you are doing the 12-course Mobile Computing specialization, taking Swift Programming is strongly recommended. However, like above, if you did not take Swift Programming and then want to take iOS, you will simply have to pick up Swift on your own (the iOS class will also cover the basics of Swift for students who didn’t take Swift Programming)
CORE SYSTEMS

• The goals of the Core Systems classes is to cover foundational concepts in how computing systems (computer architectures, networks, operating systems, compilers, databases, etc.) work.

• While your choice of Core Programming class will often be related to other courses you plan to take, your choice of Core Systems classes should be less tied to your career goals. Computing systems will underlie every technology stack you will use in your career; understanding them in-depth will allow you to become an independent learner and will make it easier for you to learn about new technologies as they come along.
CORE SYSTEMS

• **MPCS 52011 - Introduction to Computer Systems**
  Provides an overview of multiple systems topics, including digital logic, processors, computer architectures, operating systems, and compilers.
  *Also offered in the Winter*

• **MPCS 53001 - Databases**
  Covers the design and use of relational databases, with an emphasis on the SQL language.
  *Also offered in the Spring*

• **MPCS 51400 - Functional Programming**
  Provides an introduction to the Functional Programming paradigm using the Haskell programming language.
  *Has a Core Programming prerequisite. Generally not suitable for new students without an existing CS background.*
CORE SYSTEMS

• Introduction to Computer Systems is very programming-heavy. It is an excellent way to strengthen your programming skills even further, but students coming straight out of Immersion Programming have sometimes struggled with this class in the Autumn (but done fine when taking it in the Winter, after taking Core Programming)

• Databases also has a programming component, but much lighter than Introduction to Computer Systems. A popular choice for students coming our of Immersion Programming is to take Databases in the Autumn, and Introduction to Computer Systems in the Winter.

• If you already have a degree in Computer Science, you can request to take PhD-level Systems courses instead:
  – CMSC 32200: Computer Architecture
  – CMSC 33100: Advanced Operating Systems
  – CMSC 33250: Introduction to Computer Security
CORE THEORY

• The Core Theory requirement is fulfilled by taking one of these two classes:
  – MPCS 55001 - Algorithms
  – MPCS 55005 - Advanced Algorithms.

• Students coming out of Immersion Math should take Algorithms.

• Advanced Algorithms has Algorithms as a prerequisite. It is intended for students with a Computer Science background who have already taken a rigorous introduction to the formal study of algorithms. A placement exam will be conducted to determine if a student has a sufficient Algorithms background to take Advanced Algorithms (the exam will be announced on the masters-students mailing list).

• Students with a strong background in Computer Science theory may petition to take PhD-level theory courses.
WHAT TO LOOK OUT FOR IN FUTURE QUARTERS

• We will be holding course planning sessions in the Fall to provide guidance on your Winter course selection. Besides general guidance, these sessions will also provide guidance on specific tracks within the MPCS (data analytics, mobile computing, etc.)

• During the regular school year, the course selection survey takes place during the 5th week of the quarter, and registration takes place during the 8th week of the quarter.

• Some popular electives tend to fill up. Students who select those classes in the course selection survey have enrolment priority in those classes.
GENERAL COURSE PLANNING TIPS

• You do not need to come up with a course plan for your entire degree right now. It *is* useful to identify at least one complete course plan that you’d be happy with, but the MPCS does not require you to commit to a course plan.

• Keep an open mind: even if you came to the MPCS with a specific career path in mind, give yourself space to reevaluate this path based on what classes you enjoy the most.

• Balance breadth and depth: aim to take at least one elective that is outside your intended specialization or career path.

• Do not underestimate the importance of prerequisites: they are there for a good reason.
Q & A