Coding Camp (Standard/Accelerated)

Harris Math & Coding Camp

Summer 2023

Instructors

Standard track:

Arthur Cheib (arthurcheib@uchicago.edu), Sheng-Hao Lo (shenghaolo@uchicago.edu)

Accelerated track:

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For emails to instructors and TAs, please put "Coding Camp" as the first part of the subject title.

Course Description

Harris Math & Coding Camp is a three-week review course designed to ensure that incoming Master's students are proficient in the mathematical and coding concepts needed to successfully navigate the Core Curriculum. The topics and contents are identical for both Standard and Accelerated tracks; the only difference is pacing – Standard meets every day (13 lectures) while Accelerated moves faster (8 lectures). See more details on pages 3-4.

Course Meetings

All classes meet at the given time below. See more details on page 3. Students are expected to participate in the session to which they are assigned. All times listed below are in Chicago time:

- [Group A] 9:00am-10:00am
- [Group B] 12:30pm-1:30pm

TA Sessions

TAs will hold sessions right after every lecture, which will last for 60 minutes. In the sessions, TAs will explain the tasks to be completed and demonstrate how to code with R during each session, using the material covered from the lecture of the day. We encourage you to work in study groups of 3-4 students to complete the tasks. All times listed below are in Chicago time:

- [Group A] 10:15am-11:15am
- [Group B] 1:45pm-2:45pm

Communication

Communication from instructors to students will happen through posting of materials on Canvas, including postings to Announcements and sending emails. Please note that you are responsible for reading all Canvas Announcements related to the course. To ensure receipt, you may wish to confirm that you have email notifications enabled for Canvas Announcements.

As there are many students in this course, emailing your instructor directly is the least effective way to have either a logistical or a pedagogical issue resolved. Therefore, we suggest and request that communication from students take the following forms:

- Questions regarding scheduling should be directed to the Head TA: Rubina Hundal (hundal@uchicago.edu).
- Questions regarding course materials may be posted on Discussion, a forum that is monitored by all teaching assistants and instructors. Please note that, while we strive to expeditiously respond to student questions posted on Discussion, you should not expect to always receive prompt replies, especially after normal business hours. So, please do not expect to receive a response at 10:00pm on Friday evening for a question.

Textbooks

There is no assigned textbook for this course. However, the material of this course is classic and is covered in several excellent textbooks. Feel free to use the following three.

- James, Witten, Hastie and Tibshirani. *An Introduction to Statistical Learning, with Applications in R.*
- Kosuke Imai. *Quantitative Social Science: An Introduction.*
- Wickham and Grolemund. *R for Data Science (2nd edition).*

Tentative Course Schedule (subject to change)

Week	Date	Lecture/Topic (Standard)	Lecture/Topic (Accelerated)
1	8/28	No class; Module 0 (pre-work)	
	8/29	Lecture 1: Module 1	Lecture 1: Modules 1&2
	8/30	Lecture 2: Module 2	TA session only
	8/31	Lecture 3: Module 3	Lecture 2: Modules 3&4
	9/1	Lecture 4: Module 4	TA session only
2	9/4	Labor Day (No class)	
	9/5	Lecture 5: Module 5 (I)	Lecture 3: Module 5
	9/6	Lecture 6: Module 5 (II)	TA session only
	9/7	Lecture 7: Module 6 (I)	Lecture 4: Module 6 (I)
	9/8	Lecture 8: Module 6 (II)	Lecture 5: Module 6 (II)
3	9/11	Lecture 9: Module 6 (III)	Lecture 6: Module 7
	9/12	Lecture 10: Module 7 (I)	Lecture 7: Module 8
	9/13	Lecture 11: Module 7 (II)	Lecture 8: Module 9
	9/14	Lecture 12: Module 8	TA session only
	9/15	Lecture 13: Module 9	TA session only

Topics/Modules

Module 0: R and RStudio Installation Guide

Module 1: An Introduction and Motivation for R Programming

Module 2: Installing Packages, Reading Data and Accessing Data

Module 3: Vectors, Lists and Data Frames

Module 4: Investigating Data and Creating New Variables

Module 5: Data Manipulation and Analysis - Base R

- Standard: two lectures
- Accelerated: one lecture

Module 6: Data Manipulation and Analysis - Tidyverse

- Standard: three lectures
- Accelerated: two lectures

Module 7: Data Visualization

- Standard: two lectures
- Accelerated: one lecture

Module 8: Iteration and Loop

Module 9: Functions

Course Logistics

- Lectures:
  - Go through the context as much as possible
  - Run the codes directly to show results to students (some have been printed out, but the others have not) – so we need to get the **slides & RStudio** ready before lectures start
  - For all "**Try it yourself**" parts, these are shorter exercises. We will ask students to work with their group members (not required but suggested). Depending on how much time is left, it's okay to skip some of the exercises – we will post solutions to Canvas after class anyway. When appropriate, interrupt students & go over some exercises and move forward
- TA sessions:
  - Exercises will be longer – they are mainly designed for groups, not individuals
  - Solutions will be posted after class
  - All TAs will attend each coding session to help debug students' codes
- Canvas discussion board:
  - This is the place where students can post their questions
  - TAs will mainly monitor & answer the questions
  - We may help answer some questions when TAs do not know how to respond
- Others:
  - We (& TAs) don't hold office hours, though not restricted
  - For all logistics issues, students will send emails to Rubina. If she is unsure of the response, forward emails to us
  - On Day 0 (i.e. 8/28), no lecture, though we need to remind students to get their laptops prepared (i.e. have R & RStudio installed before Day 1). It would be helpful to have our IT Team help students install R & RStudio
  - Final projects are optional – TAs will help read those projects and give short comments. We will post the instructions on writing final projects (largely borrowed from last year) on Day 1