



**Dates:** June 18 – 22, 2018

**Location:**

Institute for Social Research, Room 1430  
University of Michigan

**Before you arrive in Ann Arbor...**

Online Introduction to R  
Online Introduction to Linux

**MONDAY, June 18**

- 8:30 - 9:00      Light breakfast and coffee served
- 9:00 - 9:30      *Introduction to the Workshop*  
Jessica Faul & Colter Mitchell
- 9:30 - 10:15    *Introduction to biology and genetics – understanding genomic data in populations*  
Kelly Bakulski
- 10:15 - 11:00   *Population stratification and admixture – avoiding the pitfalls and utilizing the strength of ancestry and admixture*  
Jennifer Smith
- 11:00 - 11:15   Break
- 11:15 - 12:00   *Quality control – estimating and interpreting minor allele frequency, understanding strands, Hardy-Weinberg equilibrium, heterozygosity,*  
Jennifer Smith
- 12:00 - 1:00    Lunch Provided
- 1:00 - 1:45      *Collecting, extraction, and storing genetic material; cost and coverage of different platforms/chips*  
Jessica Faul
- 1:45 - 4:45      *Lab:*  
*Linux Mini*  
*Understanding genetic file types and the content of the files*  
*Viewing and exploring genome-wide data*  
Erin Ware
- 5:00              *Social Event at ISR*

## **TUESDAY, June 19**

- 8:00 - 8:30 Light breakfast and coffee served
- 8:30 - 9:00 Recap of the previous day and questions
- 9:00 - 9:45 *Intro to the Wisconsin Longitudinal Study*  
Pam Herd, University of Wisconsin
- 9:45 - 10:15 *Exploring the Microbiome*  
Pam Herd, University of Wisconsin
- 10:15 - 10:30 Break
- 10:30 - 11:00 *Imputation – basic explanation of genotype imputation, inputs and outputs, using online reference panels HapMap and 1000 Genomes Project*  
Jennifer Smith
- 11:00 - 12:00 *GWAS and Heritability - alleles, effects, models, p-values, SNP-based heritability, LD score regression*  
Jennifer Smith
- 12:00 - 1:00 Lunch (on your own)
- 1:00 - 4:00 *Lab: Understanding and working with different genomic coding schemes*  
*Assessing genomic data quality control*  
Erin Ware

## **WEDNESDAY, June 20**

- 8:00 - 8:30 Light breakfast and coffee served
- 8:30 - 9:00 Recap of the previous day and questions
- 9:00 - 9:45 *Statistical power - multiple testing and replication*  
Colter Mitchell
- 9:45 - 10:30 *Structural and rare variants*  
Jennifer Smith
- 10:30 - 10:45 Break
- 10:45 - 11:30 *Gene-environment interaction models –candidate genes, polygenic scores, formal testing*  
Colter Mitchell
- 11:30 - 12:00 *Online genomic resources*  
Jessica Faul

12:00 - 1:00 Lunch (on your own)

1:00 - 4:00 *Lab:*  
*Extracting genetic data*  
*Polygenic score construction and analysis*  
Erin Ware

#### **THURSDAY, June 21**

8:00 - 8:30 Light breakfast and coffee served

8:30 - 9:00 Recap of the previous day and questions

9:00 - 10:00 *Examining the dynamic gene: epigenetics*  
Colter Mitchell

10:00 - 10:30 *Telomeres*  
Colter Mitchell

10:30 - 10:45 Break

10:45 - 11:30 *Constructing polygenic scores*  
Ben Domingue, Stanford University

11:30 - 12:00 *Conducting research using polygenic scores*  
Ben Domingue, Stanford University

12:00 - 1:00 Lunch (on your own)

1:00 - 4:00 *Lab:*  
*Epigenetic data-quality control and analysis*  
Erin Ware and Kelly Bakulski

5:00 *Social Event at the Pretzel Bell, Captain's Room, Main St Ann Arbor*

#### **FRIDAY, June 22**

8:00 - 8:30 Light breakfast and coffee served

8:30 - 9:00 Recap of the previous day and questions

9:00 - 9:30 *Collaborating – working with labs and consortia and finding a collaborator*  
Jessica Faul

9:30 - 10:15 *Data Sources – HRS/HRS Sister Studies, AddHealth, Fragile Families, UKBiobank, MESA*

10:15 - 10:30 Break

10:30 - 12:00 *Student presentations I*

12:00 - 1:00 Lunch provided

1:00 - 3:00 *Student presentations II*

3:00 - 3:15 Break

3:15 - 3:45 *Pitching your ideas and publishing your work - How to justify your work in a grant application, common review complaints, journals and funding*  
*Ethics*  
Faculty Panel

3:45 - 4:00 Final Remarks and Evaluation of Course