**Syllabus for Bioinformatics Bootcamp – R for Biologists (Pre-mat Course)**

**Dates and times:** TBD

**Location**: TBD

**Instructor**: Henry Miller, M.S.  
**Title:** 4th year graduate student, IBMS PhD Program  
**Email:** [millerh1@uthscsa.edu](mailto:millerh1@uthscsa.edu)

**Office hours:** <https://calendly.com/millerh1/30min>

**Advisor:** Yidong Chen, Ph.D.  
**Title:** Professor, Population Health Sciences  
**Email:** [cheny8@uthscsa.edu](mailto:cheny8@uthscsa.edu)

**Description and Learning Outcomes:**

This workshop will teach fundamental programming techniques with R geared towards applications in biology research. Most sessions will consist of a 30-40-minute lecture, with hands-on activities guided by the instructors which, if not completed before the workshop ends, will be finished for homework. The skills gained will include:

1. Data structures
2. Plotting
3. Reading/writing files
4. Conditional logic & control flow
5. Function definitions
6. Data processing pipelines with Tidyverse
7. Basic genomics analysis

**Course outline**

**Prior to the workshop**

Homework: Before the workshop begins, all participants will be provided with access to DataCamp Classroom. Before the first session, each participant is required to complete the following courses in DataCamp:

1. **\***Introduction to R
2. **\***Intermediate R
3. \*\*Introduction to the Tidyverse

**\***Alternatively, score > 60% on the “R Programming” DataCamp assessment.

**\*\*** Alternatively, score > 60% on the “Data Manipulation with R” DataCamp assessment.

**Module 1: R for Data Science Review**

Lecturer: Henry Miller

Activity/Homework: Module #1 practice problems.

Date: August 4th - 5PM CST

**Module 2: R for biological data science Pt I**

Lecturer: Henry Miller

Activity/Homework: Analyze qPCR data using R.

Date: August 5th - 5PM CST

**Module 3: R for biological data science Pt II**

Lecturer: Henry Miller

Activity/Homework: Analyze SARS-CoV-2 dataset.

Date: August 11th - 5PM CST

**Module 4: Project presentations and next steps**

Lecturer: Henry Miller

Activity: Present results of analysis.

Date: August 12th - 5PM CST

**Additional information:**

* This workshop does not provide a grade and is not credit-bearing.
* **Zoom lectures will be recorded**
* For additional help, instructors may be reached by email at any time.
* Course materials, including zoom recordings, will be hosted on Box and/or youtube/github and a link will be provided to all attendees.