**Syllabus for Bioinformatics Bootcamp – R for Biologists (Spring 2020)**

**Dates and times:** Mondays 5-6:30PM, February 22nd – May 3rd

**Location**: <https://zoom.us/j/92088361804?pwd=dldLQ0Y5RjUxVSsxelIvZHI0OFZIZz09>

**Instructor**: Aiola Stoja  
**Title:** 1st year graduate student, IBMS PhD Program  
**Email:** [stoja@uthscsa.edu](mailto:stoja@uthscsa.edu)

**Office hours:** TBD

**Instructor**: Simon Levy  
**Title:** 5th year graduate student, IBMS PhD Program  
**Email:** [levys@uthscsa.edu](mailto:levys@uthscsa.edu)

**Office hours:** TBD

**Instructor**: Henry Miller, M.S.  
**Title:** 3rd 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 and basic RNA-sequencing analysis approaches, such as differential expression analysis and gene heatmaps. Most sessions will consist of a 30-40-minute lecture, followed by hands-on activities guided by the instructors which, if not completed before the workshop ends, will be finished for homework. In the final two weeks, students will complete a final project which combines skills learned throughout the workshop.

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

**Course outline**

**Week 1: Orientation and Setting up R**

Lecturer: Henry Miller

Activity/Homework: Download R & RStudio, Introductory R course in DataCamp

Date: Feb 22nd

**Week 2: Data structures in R**

Lecturer: Aiola Stoja

Activity/Homework: Intermediate R course in DataCamp, importing flat files chapter in DataCamp, and R assessment in DataCamp, week two practice problems

Date: Mar 8th

**Week 3: Fundamental programming concepts in R**

Lecturer: Aiola Stoja

Activity/Homework: Intermediate R course in DataCamp, importing flat files chapter in DataCamp, and R assessment in DataCamp, week two practice problems

Date: Mar 22nd

**Week 4: Review week**

Lecturer: Aiola Stoja

Activity/Homework: Introduction to the Tidyverse in DataCamp

Date: Apr 5th

**Week 5: The Tidyverse**

Lecturer: Simon Levy

Activity/Homework: Week four practice problems, continue practicing on DataCamp

Date: Apr 19th

**Week 6: R for biological data science**

Lecturer: Simon Levy

Activity/Homework: Analyze qPCR data using R

Date: May 3rd

**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.