

The AU **Summer** Data Science Experience (a paid Professional Development Opportunity)

Join other DCPS teachers and staff for three days in July for a fun and informative Data Science and Computer Programming experience! Experience an introduction to Data Science where you will review and apply statistical methods during an intense hands-on introduction to the R statistical programming language. No programming experience is required. AU’s Data Science faculty will help you learn how to collect, organize, and visualize data. Data Science graduate students will provide individualized assistance as well. Teacher participants will be paid a stipend.

**When**: Monday July 12, 2021 – Wednesday July 14, 2021, 9:00 AM – 1:00 PM

**Invited Participants**: DCPS Teachers and Staff

**Delivery Platform**: All activities will be on-line using Canvas and Zoom

**Materials:** All software and references are free. You must have a laptop computer.

**Schedule of Activities** (Tentative):

Day 1

**9:00 – 9:30:** Greetings/Opening Messages/Introductions (AU Staff and DCPS attendees)

* What is Data Science? / The Growth and Influence and Importance of Data Science

**9:30 – 10:30:** Introduction to the R Programming Language (Origin/Focus/Utility)

* R and R Studio installation support
* Overview of Tidyverse and its sub-packages
* Installation of package(s)/Tidyverse
* Overview of the Rstudio Integrated Development Environment
* R Trouble Shooting Tips

**10:30 – 11:40:** R as a powerful calculator, preliminary and basic R commands for calculations, analysis, and applications; Variable types, Vectors, data frames and lists

**11:40 – 11:50**: Break

**11:50 – 12:45**: Practice / reinforcement work/application activities

**12:45- 1:00:** Summary/Wrap Up/Reflections/Closure

Day 2

**9:00 to 10:45** Exploration and Analysis of Data Sets

* Retrieving and analyzing embedded R Data Sets
* Using R commands to import Data from an external location
* Using R to create Data Sets

**10:45 to 10:55:** Break

**10:55-11:50**: R for Data Visualization - Using R code to generate the following graphs and plots: Bar graphs/Histograms/Boxplots/Pie Charts/Scatter Plots/Stem and Leaf Plots/Violin Plots

**11:50- 12:00**: Break

**12:00 - 12:50:** Practice / reinforcement work/application activities

**12:50 - 1:00:** Summary/Wrap Up/Reflections/Closure

Day 3

**9:00 - 9:45** Data Transformation

* Introduction to and applications of the DPLYR functions:
* Select/Filter/Arrange/Mutate/Group By-Summarize

**9:45 to 10:30:** Tidying Data: Analysis of Non-tidy Data, Tidy Data, Techniques for Tidying Data,

**10:30 - 10:40:** Break

**10:40 - 11:40** Miscellaneous R applications, Matrix operations, Writing Functions, Probability…

**11:40 - 11:50:** Break

**11:50am - 12:50:** Practice / reinforcement work/application activities

**12:50 to 1:00:** Summary/Wrap Up/Reflections/Closure

**Points of Contact:**

**DCPS: Gabriel Cartagena:** [gabriel.cartagena@k12.dc.gov](mailto:gabriel.cartagena@k12.dc.gov)

**American University: James Dickens,** [jdickens@american.edu](mailto:jdickens@american.edu)

**The NASA DC Space Grant Consortium: Eric Day,** [day@spacegrant.org](mailto:day@spacegrant.org) , [eday@american.edu](mailto:eday@american.edu)