

# **Analytics Camp at MJ Test Prep**

*with Applications in R using Sports Data*

## **Lectures: (48 hours)**

– Baseline Statistics | 7:00-9:00 pm  
*Tuesdays (8)*

\*Baseline R | 7:00-9:00 pm  
*Thursdays (8)*

+Case Studies using R | 6:00 pm -  
10:00 pm  
*Sundays (4)*

- Private Slack Workspace to interact with Michael and your classmates.
- Zoom integration with live polling, coding, and case studies.
- Drive integration with 50 + hours of homework, reading, etc.
- Interactive applications and coding modules to practice.
- Full-length course project.
- 1 on 1 intensive career sessions and project building discussions.

- Obtaining and organizing data.

- Probability distribution functions.

- Sampling distributions.

- Hypothesis testing and confidence intervals.

- Regression techniques.

\* Basics of R: Working with data, calculations, and programming.

\* Data manipulation in the Tidyverse.

\* Data visualization using ggplot2, plotly, and more!

\* Workflows, project management, git control, publishing, etc.

+ Case studies with sports data, technologies in sports, and more!

All sessions will be held on Zoom (VERY LIMITED availability)

## **Instructor**

*Michael S. Czahor, PhD (Statistics and Wind Engineering)*

*Lead Quantitative Analyst, Philadelphia Phillies*

# Key Takeaways

At the end of the course, participants will be able to:

- Use introductory statistical tools (i.e., t-tests).
- Use R functions for statistical analysis.
- Use tools within the Tidyverse.
- Generate and interpret interactive visuals using ggplot2, plotly, etc.
- Make better data-driven decisions.
- Apply concepts from the theoretical and applied lessons to real world sports problems.
- Identify relevant career options in data-science and sports.
- Build interactive dashboards and create reproducible research on a personalized website.

## Who Should Attend

- Advanced high school students ages 14 - 18.
- Undergraduate college students with minimal statistics experience.
- Working professionals with an interest in analytics and/or sports.
- Individuals who took an intro class and would like to refresh their knowledge.

## Prerequisites

- Knowledge or familiarity with basic statistics and programming will be useful, but is not necessary. Michael will get everyone up to speed right away.

## Format

- Online lectures (with interactive Q&A)
- Online coding sessions (with interactive Q&A)
- Interactive RStudio emulator built using Docker.
- Slack Workspace to easily interact with each other.
- Workshops with applications in sports.
- *Extra teaching materials that Michael has developed over the last five years (i.e., worksheets with solutions, tests, coding samples, and more will be provided as well for extra practice).*

# Meet your instructor: Michael S. Czahor, PhD

In 2020, Michael S. Czahor, PhD was promoted to Lead Quantitative Analyst of the new Integrative Baseball Performance Department for the Philadelphia Phillies. His primary research interests include Bayesian modeling in STAN, vector autoregressive time series modeling, and statistical reliability engineering. Michael is also a statistical coach/tutor for students at local universities and consults on a large-scale learning management system project for college preparation. Outside of work and research Michael enjoys coaching youth sports and traveling with his wife.

While doing his doctoral work, Michael led efforts to analyze Big 12 Referees in NCAA Basketball games. Just after receiving his doctorate in 2018, Michael was hired as a Quantitative Analyst for the Philadelphia Phillies, where he currently works full-time.

In 2018, Michael earned a Co-Major Doctorate of Philosophy under Distinguished Professor Dr. Bill Meeker, with honors in Statistics and Wind Turbine Engineering at Iowa State University. During Michael's time in graduate school, he taught undergraduate statistics courses to classes with approximately 80 students. Michael developed an extensive amount of interactive problem sets for students in introductory statistics classes. His efforts earned him the Teaching Excellence Award on behalf of the Statistics department at Iowa State university.

In 2016, Michael earned a Masters of Science in Statistics at Iowa State University, focusing on field failures of large-scale wind turbines. While earning his Masters, Michael was hired as a research consultant at the prestigious Fraunhofer Research Institute in Hanover, Germany, where he developed reliability algorithms to predict when field failures of power converters within doubly-fed induction generator turbines would occur.

In 2014, Michael was awarded an Integrative Graduate Education Research Trainee (IGERT) Fellowship on behalf of the National Science Foundation to pursue statistical research in the field of wind energy.

Michael graduated with honors from Rowan University in 2013 with a Bachelors in Mathematics. During his time as an under-

graduate, Michael was a statistician intern for the Philadelphia 76ers. His senior project was centered around applied survival analysis methods for cancer patients.

"Michael is the best teacher I have had in my time at college so far. He went above and beyond to provide us with extra study materials. He explained concepts clearly and slowly. He was prompt in responding to emails, and also was always available for appointments after each session. I have been immensely impressed with Michael's teaching abilities. Michael was always happy to provide extra help when needed, he genuinely loves statistics and has an unbelievable ability to simplify complex topics through creative illustrations and examples. I feel that I have learned a lot in this class and look forward to taking more statistics classes. This is the first stat class I have taken, I feel confident in my ability to continue on in stat classes because of the solid base of knowledge Michael helped me obtain. He puts in extra, unrequired work to make sure that his students succeed."-former student

"I've known Michael since we started our Ph.D.s together in 2013. We learned together in doctorate level classes, and taught undergraduate classes together until we graduated.

Throughout graduate school he was always the guy that would sit down to work on a problem or project and not get up until it was done the right way. This dedication combined with his Math and Stat backgrounds make Michael a great problem solver. He has the ability to see problems from different angles, because he has looked at problems from so many different angles himself. He has figured out how he learns, how that differs from how others learn, and I think the people he's teaching (and has taught in the past) benefit from his ability to re-frame difficult concepts into problems that make intuitive sense to students.

I wish Michael the best with his teaching endeavors, but I don't think wishes are needed. I know that once Michael and a student start working together he won't get up until that student has all the tools they need to succeed in the subject they're studying."-former classmate

