



## **CLRES 2020: BIostatISTICS**

### **STATISTICAL APPROACHES IN CLINICAL RESEARCH**

#### ***COURSE DESCRIPTION***

This course focuses on basic concepts and methods of statistics and their application to problems in the health and biomedical sciences. Topics include graphical and numerical descriptions and summarization of data, basic probability theory, probability distributions, point and confidence interval estimation, and hypothesis testing with emphasis on one- and two-sample comparisons involving continuous and categorical data. Correlation, simple linear regression, and analysis of variance will be introduced. Scholars will work with clinical datasets and will learn to analyze the data and explain their findings. This rigorous first course in biostatistics will serve as a prerequisite for other biostatistics courses.

#### ***COURSE OBJECTIVES***

At the completion of the course, the trainees should:

- know the basic statistical procedures used to analyze data;
- be able to apply these techniques utilizing a standard statistical package;
- appreciate the concepts of random variation and bias;
- appreciate the wide range of applications of biostatistical methods to problems in medicine and public health;
- know some specific applications in a specialized area of interest; and
- recognize pitfalls in interpreting biomedical and public health data.

#### ***INSTRUCTOR AND COURSE DIRECTOR***

- **Doug Landsittel, PhD**
  - Associate Professor, Department of Medicine, University of Pittsburgh
  - 200 Meyran Avenue, Suite 300 (Office #322)
  - Tel: 412-864-3019
  - Email: [dpl12@pitt.edu](mailto:dpl12@pitt.edu)
  - Office Hours: Thu 8:30am – 10am and by appointment

#### ***CO-INSTRUCTORS***

- **Charity G. Moore, PhD**
  - Associate Professor, Department of Medicine, University of Pittsburgh
  - 200 Meyran Avenue, Suite 300 (Office # 327)
  - Tel: 412-246-6961
  - Email: [cgm14@pitt.edu](mailto:cgm14@pitt.edu)
- **Kaleab Abebe, PhD**
  - Assistant Professor, Department of Medicine, University of Pittsburgh
  - 200 Meyran Avenue, Suite 300 (Office # 325)
  - Tel: 412-246-6931
  - Email: [kza3@pitt.edu](mailto:kza3@pitt.edu)



## **TEACHING FELLOWS**

- **Jonathan Yabes, MS**
  - PhD Student, Department of Biostatistics, University of Pittsburgh
  - 200 Meyran Avenue, Suite 300
  - Email: [jgy2@pitt.edu](mailto:jgy2@pitt.edu)
  - Office hours: TBD
- **Elan Cohen, MS**
  - Statistician, Department of Medicine, University of Pittsburgh
  - 200 Meyran Avenue, Suite 300
  - Email: [elc30@pitt.edu](mailto:elc30@pitt.edu)
  - Office hours: By appointment

## **MEETING TIMES & LOCATION**

**January 4, – April 1, 2010**

### **Lecture**

Tue, Thu 10:30am – 12noon  
Suite 222, Parkvale Building  
(200 Meyran Avenue)

### **Recitation**

***Trainees need to choose 1 of the following 2 sessions and stay in the same session throughout of the term.***

Session 1: Tue 1 – 2pm, Suite 222, Parkvale Building  
Session 2: Thu 1 – 2pm, Suite 222, Parkvale Building

### **Lab**

***Trainees need to attend the following session throughout of the term.***

Tue 2 – 5pm, Suite 222, Parkvale Building

**The course is worth 4 credits.**

## **GRADING**

Letter grade based on

30%	Average of 12 homework assignments
10%	Average of 12 lab assignments
20%	Midterm examination (in class)
30%	Final examination (in class)
10%	Attendance



## TEXTBOOK

Rosner B (2006). *Fundamentals of Biostatistics, 6th Edition*. Duxbury Press, Pacific Grove, CA.

Also recommended (optional):

- Rosner B (2000). *Study Guide for Fundamentals of Biostatistics*. Duxbury Press, Pacific Grove, CA.
- Glover TJ and Mitchell KJ (2002). *An Introduction to Biostatistics*. McGraw-Hill, New York.
- Fisher LD and van Belle G (1993). *Biostatistics: A Methodology for the Health Sciences*. Wiley, New York.

## COMPUTING PACKAGE

**Stata 10, Stata Press, College Station, Texas ([www.stata.com](http://www.stata.com))**

We recommend that students purchase or have ready access to this program. It can be purchased through [www.stata.com](http://www.stata.com). University of Pittsburgh does have a Stata “Grand Plan” available so the cost is reduced to students in this course. Stata is available at the course computer labs (Stata 10), at the Posvar Hall (Stata 10), and at the Falk library in Scaife Hall (Stata 10). For details, please click **Software Info** in the manual box on the left.

Highly recommended books for Stat component of the course

- Hamilton LC. *Statistics with Stata (Updated for Version 9)*. Duxbury Press, Pacific Grove, CA

## SOFTWARE INFORMATION

You will need to have access to a computer, a printer and specific statistical software to do the homework in the statistics courses. There are two statistics programs needed to do your homework in the statistics course.

### StaTable

StaTable provides interactive way to calculate probability values and/or critical values for the twenty-five most commonly used statistical distributions. The software can be downloaded from the web with no additional charge.

#### How to download StaTable from the internet

Connect to the Internet. Go to [www.cytel.com/](http://www.cytel.com/). Select **Products** on the menu bar and choose **StaTable**. Follow the instructions. On the right hand side of the new screen, you can choose **StaTable for Windows Free Download** or **StaTable for Palm Free Download**.



## Stata 10

Stata 10 can be accessed from our course computing lab (Stata 10), the University computer labs at Posvar Hall (Stata 10) or in Falk Library at Scaife Hall (Stata 10). Stata 10 can also be purchased via GradPlans. In the past we have recommended that students purchase Intercooled Stata plus the Getting Started manual (\$155) and the three-volume *Base Reference Manual plus Data Management Reference Manual, User's Guide, and Quick Reference and Index* (\$179). This is the best if you are planning to do multivariable modeling or intensive analyses when you are finished with this course. If your plans are for small studies and the statistics modules in the program, student version of Intercooled Stata 10 and *Getting Started* manual with one-year license (\$95) or student version of Small Stata 10 and *Getting Started* manual with one-year license (\$48) will be sufficient. If you are buying only Small Stata and the Getting Started Manual, you will need to purchase the *Statistics with Stata (Updated for Version 9)* textbook as a reference. If you have decided to purchase Stata it is best to have it in your computer by July 1. (See instructions below).

### Important numbers/locations for Stata GradPlans at Pitt

#### How to order Stata

Go to <http://www.stata.com/info/order/new/edu/gradplans/gp3-order.html>. You can purchase Stata with a purchase order, a university p-card or your credit card. In some cases you may be able to get your department/ grant to pay for software. Ms. Jennifer Kush can also help you order the software. Contact her ([kushja@upmc.edu](mailto:kushja@upmc.edu) or 412-586-9673) if you need assistance.

Stata is also available for Mac and Linux machines. Make sure you specify the platform you are using when you order the programs.

## **ACADEMIC INTEGRITY**

Trainees in this course will be expected to comply with the [University of Pittsburgh's Policy on Academic Integrity](#). Any trainee suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no trainee may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

## **DISABILITIES**

If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructors and the [Disability Resources and Services](#) no later than the 2nd week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call 412-648-7890 (Voice or TTD) to schedule an appointment. The Office is located in 216 William Pitt Union.



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