

# Syllabus and Calendar for Biostatistics (Biology 5312)

## Course Hours and Location

Tuesday 5:30pm-8:00pm, BioLife 237

## Instructors

Junchao Xia: [junchao.xia@temple.edu](mailto:junchao.xia@temple.edu) (office: SERC 718)

Yujin Chung: [yujin.chung@temple.edu](mailto:yujin.chung@temple.edu) (office: BioLife 218)

William Flynn: [tuf31071@temple.edu](mailto:tuf31071@temple.edu) (office: SERC 718)

**Office Hours:** Please email to arrange office hours or meetings

## Textbook

**B. Rosner. “*Fundamentals of Biostatistics*”, 7<sup>th</sup> edition, Brooks/Cole, 2010 (ISBN 978-0-538-73349-6)**

## Homework

Homework will be assigned weekly throughout the semester. Assignment scores will contribute to the final grade equally, each carrying 20 points maximum. Assignments are strongly suggested to be turned in electronically via Blackboard, on paper in class is discouraged. Assignments turned in up to 24 hours late will carry a penalty of 5 points. There will be no grade for assignments turned in more than 24 hours late. Exemptions may be requested, no later than one day before the due date.

## Exams and Final Grades

There is no exam for this course. All weekly homework will contribute equally to the final grade.

## Course Technology Requirement

Students are expected to have a laptop computer in good working order and to bring that to each class.

## Computer Software

Each lecture will include an R session. Students are expected to install R and RStudio on their laptops. To typeset assignments, each student can make use of any software of their choice, provided that the file submitted is in Adobe PDF and MicroSoft Office.

### Tentative Calendar

Week	Subject	Chapter	Instructor
1 Aug. 30	<b>Introduction/Exploratory Data:</b> summary statistics, graphic methods <b>R introduction</b>	2	Yujin
2 Sep. 06	<b>Elements of probability theory; Random variables;</b> Conditional probability; Bayes' theorem <b>Graphs with R</b>	3	Junchao
3, Sep. 13	<b>Discrete and continuous probability distributions</b> <b>Random number generation (R)</b>	4-5	Junchao
4, Sep. 20	<b>Sampling distributions</b> higher-order statistical moments (skewness, kurtosis), standard deviation of derived data (chain rule), central limit theorem. <b>Simulation study:</b> CLT, More plotting (Q-Q plot etc)	2,6	Junchao
5, Sep. 27	<b>Estimations, Confidence intervals,</b> <b>Bootstrapping methods</b>	6-8	Yujin
6 Oct. 04	<b>Statistical hypothesis testings:</b> one/two-sample hypothesis testings	7-8	Yujin
7 Oct. 11	<b>Multisample hypothesis testing</b>	12	Yujin
8 Oct. 18	<b>Categorical data analysis</b>	10	Yujin
9 Oct. 25	<b>Non-parametric test; Permutation test</b> Mann–Whitney U; Wilcoxon signed-rank tests; Kruskal–Wallis test;	9	Bill
10 Nov. 01	<b>Regression and correlation:</b> least squares, inference, correlation coefficients (Pearson and Spearman), analysis of covariance (ANCOVA).	11	Junchao
11 Nov. 08	<b>Multiple testing</b> Bonferroni correction, false discovery rate (FDR)		Junchao
12 Nov. 15	<b>Data clustering methods:</b> principal components analysis, k- mean, and hierarchical methods		Junchao
13 Nov. 29	<b>Maximum entropy principle and maximum likelihood estimation</b>		Yujin
14 Dec. 6	<b>Optimizations</b> <b>Creating R packages</b>		Yujin

### Academic honesty and Civility

You must abide by Temple's Code of Conduct, which prohibits:

1. Academic dishonesty and impropriety, including plagiarism and academic cheating.
2. Interfering or attempting to interfere with or disrupting the conduct of classes or any other normal or regular activities of the University.

Please also see <http://www.temple.edu/grad/policies/> for grading policies. All work turned in will be examined by instructors, and by plagiarism checking software. Students found to have plagiarized will fail the course and be reported to the Office of Student Conduct of Temple University. Students do not have permission to publish or post any classroom materials to online sites.

### **Disability Disclosure**

Any student who has a need for accommodation based on the impact of a documented disability, including special accommodations for access to technology resources and electronic instructional materials required for the course, should contact the instructor privately to discuss the specific situation by the end of the second week of classes or as soon as practical. If you have not done so already, please contact Disability Resources and Services (DRS) at 215-204-1280 in 100 Ritter Annex to learn more about the resources available to you.

### **Student and Faculty Academic Rights and Responsibilities Policy**

Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed at:

[http://policies.temple.edu/getdoc.asp?policy\\_no=03.70.02](http://policies.temple.edu/getdoc.asp?policy_no=03.70.02)