

**Credit #4 of BIOS 672 (FALL 2018)**  
Selected Topics

**Lecture Time/Location:**

Thursday, 9:50am to 10:50am, McGavran-Greenberg (McG) 1305

**Instructor:**

Jianwen Cai, Ph.D

Cary C. Boshamer Distinguished Professor and Vice Chair

Department of Biostatistics, CB #7420

Office: McG 3101D

Email: [cai@bios.unc.edu](mailto:cai@bios.unc.edu) Phone: 919-966-7788

Office Hours: Thursday 4:30-5:30pm

**Course Assistants:**

Benjamin Langworthy, [blangwor@live.unc.edu](mailto:blangwor@live.unc.edu)

Bridget Lin, [bmlin@live.unc.edu](mailto:bmlin@live.unc.edu)

Sean McCabe, [mccabes@live.unc.edu](mailto:mccabes@live.unc.edu)

Office Hours (in Room McG – 2303):

Monday 12:30-1:30pm

Wednesday 9:30-10:30am, except for 9/26/18 which will be 9-10am

Friday 3:00-4:00pm

**Prerequisites**

A working knowledge of multivariate calculus (e.g., MATH 33 at UNC)

**Textbook:**

*Understanding Analysis* by Abbott 2001 or 2015

<http://link.springer.com/book/10.1007/978-1-4939-2712-8>

**Lecture Notes:**

Copies of the slides used in lectures will be made available on the Sakai web site prior to class.

<https://sakai.unc.edu/portal/site/bios672-credit-4>

**Other useful texts:**

*Mathematical Analysis* by Apostol

*Introduction to Real Analysis* by Bartle and Sherbert

### Grading for Credit #4:

50% homework (weekly), 50% exams (2 exams, 25% each).

### Course Grading for Bios 672:

The grade for the entire course is based on a weighted average of two parts: 1) grade from the first 3 credits (see Grading in the combined Bios 660/Bios 672 syllabus) and 2) grade from credit #4. The weights are proportional to the credit hours.

### Homework:

Weekly homework assignments are due at the beginning of class. You are allowed and even encouraged to discuss with peers, but write your own work. All work submitted must be your own. Copying or simply dividing up assignments among collaborating students is not allowed. Questions concerning the homework assignments can be addressed to the course instructor or the course assistant. Questions concerning grading of homeworks should be addressed to the course assistant. Students may request regrades for homeworks, see *Regrade Policy* below.

### Late Homework Policy:

Homework will be due at the beginning of class. Points will be deducted if homework is turned in late according to the following schedule:

If homework is turned in late but on the same day of the due date, 10% of total possible points will be deducted.

If homework is turned in the next day after the due date, 20% of total possible points will be deducted.

If homework is turned in two calendar days after the due date, 30% of total possible points will be deducted.

In general, homework will not be accepted three calendar days or later after the due date.

### Exams:

Given in class on (Tentatively) Thu Oct 4 and Thu Nov. 29. Closed book, *one one-sided* summary sheet **written by hand** allowed for the first Exam, *two one-sided* summary sheet **written by hand** allowed for the second Exam. Students may request regrades for exams, see *Regrade Policy* below.

### Tentative List of Topics:

1. Convergence of sequences. Series - power series, infinite series, types of convergence, sums of infinite and finite series, Taylor's series, expressions of certain functions as infinite series
2. Definition of Big O and little o, uniform boundedness
3. Functions - limits, l'Hopital's rule, continuity, step functions, differentiable functions
4. Integration - Riemann, Stieltjes, Lebesgue integration, integrable functions
5. Operations - interchanging order of differentiation and integration, interchanging order of summation and integration, integration by parts, Fubini's theorem, dominated convergence theorem, monotone convergence theorem, bounded convergence theorem
6. Complex variables, Laplace transforms, Fourier transforms, inversion formulas

## **Regrade Policy:**

Students that perceive that a problem on any assignment has been incorrectly graded must submit for a full regrade of the entire assignment per the regrade procedure (note: Mistakes in adding up points do not require full regrade).

### *Regrade Procedure:*

- Entire assignment must be submitted for regrade by the next class after the assignment has been returned.
- Students must write a full paragraph clearly detailing why they believe their solution is correct/deserves additional credit.
- Regrades will be conducted with regard to the entire assignment, i.e. all problems will be reconsidered.
- Regrades may result in higher, unchanged, OR **lower** scores (grading errors can occur in both directions).
- Regraded scores are final.

## **The Honor System**

The University of North Carolina at Chapel Hill has had a student-administered honor system and judicial system for over 100 years. The system is the responsibility of students and is regulated and governed by them, but faculty share the responsibility. If you have questions about your responsibility under the honor code, please bring them to your instructor or consult with the office of the Dean of Students or the Instrument of Student Judicial Governance. This document, adopted by the Chancellor, the Faculty Council, and the Student Congress, contains all policies and procedures pertaining to the student honor system. Your full participation and observance of the honor code is expected.

**Four general responsibilities under the Code.** The Instrument of Student Judicial Governance, which contains the provisions of the Honor Code, states that students have four general responsibilities under the Code:

1. Obey and support the enforcement of the Honor Code;
2. Refrain from lying, cheating, or stealing;
3. Conduct themselves so as not to impair significantly the welfare or the educational opportunities of others in the University community; and
4. Refrain from conduct that impairs or may impair the capacity of University and associated personnel to perform their duties, manage resources, protect the safety and welfare of members of the University community, and maintain the integrity of the University.

**Plagiarism.** Plagiarism in the form of deliberate or reckless representation of another's words, thoughts, or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise.

**Authorized vs. Unauthorized Collaboration.** All academic work in this course, including homework, quizzes, and exams, is to be your own work. It is your responsibility if you have any doubt to confirm whether or not collaboration is permitted.

**Unauthorized devices and materials.** Electronic devices including calculators are NOT allowed during exams. Internet use is NOT allowed in the classroom.

**Consequences.** Under the Instrument of Student Judicial Governance, the usual sanction for a first time academic offense is suspension for one academic semester and a failing grade.

**Additional Information.** Additional information is available from the Office of the Dean of Students, or the Honor System <http://honor.unc.edu>.