

University of Florida College of Public Health & Health  
Professions **PHC 7066: Large Sample Theory (Spring 2021)**

M: 9:35-10:25; W: 8:30-10:25, HPNP G-301

Delivery Format: On Campus

**Instructor Information:**

Somnath Datta, Professor

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Department of Biostatistics

College of Public Health & Health Professions

Office Hours: By appointment (e-mail me)

**Prerequisites:** STA 6326 and STA 6327 (or equivalent)

**Course Overview:** This is a required core course for the PhD in Biostatistics. It will provide a detailed introduction to large sample theory, focusing on modes of convergence, techniques for establishing asymptotic normality, and applications in parametric and non-parametric estimation and testing. Large sample theory for bootstrap approximations will be introduced as well.

**Course Objectives:** Upon successful completion of the course, students will be able to:

- Understand the fundamental concepts in first order large sample theory.
- Apply these large sample results to their own methodological research.

**Required Textbook:** None.

**Recommended Reference Books:**

Lehmann, E.L. (2010) Elements of Large-Sample Theory, Springer. ISBN 978-1-4419-3136-8

Van der Vaart, A.W. (1998) Asymptotic Statistics, Cambridge. ISBN 0-521-78450-

Serfling, R. J. (2001) Approximation Theorems of Mathematical Statistics, Wiley, 2001, New York.

Dasgupta, A. (2008) Asymptotic Theory of Statistics and Probability, Springer.

**Course Requirements/Evaluation/Grading:** Students will be evaluated based upon homework assignments and exams. The professor reserves the right to revise these if needed.

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| <input type="checkbox"/> Homework (30%)                           | <input type="checkbox"/> In class exams (30%) |
| <input type="checkbox"/> Attendance and class participation (10%) | <input type="checkbox"/> Final exam (30%)     |

The grading scale for this course consists of the scale, including minus grades, below. The conversion factors for grade point values assigned to each grade are also included (in parentheses):

94% - 100% = A (4.00)	77% - 79% = B- (2.67)	64% - 66% = D+ (1.33)
90% - 93% = A- (3.67)	74% - 76% = C+ (2.33)	60% - 63% = D (1.00)
85% - 89% = B+ (3.33)	70% - 73% = C (2.00)	57% - 59% = D- (0.67)
80% - 84% = B (3.00)	67% - 69% = C- (1.67)	Below 57% = E (0.00)

For more detail on letter grades and university policies related to them, see the Registrar's Grade Policy regulations at <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

**Homework:** Bi-weekly assignments are planned. Information will be provided in class. Discussion on homework problems is allowed, but plagiarism is prohibited.

**Class Involvement:** students are encouraged to be actively engaged in classes. Responses to teacher's requests on sharing thoughts or solutions will be rewarded.

**Topical Outline:** Adjustments to this schedule may be made during the semester. The instructor will strive to be informative and fair regarding any changes.

Topic	Weeks of
Review of probability concepts	Jan 11, 18
Modes of convergence	Jan 20, 25
CLT and delta method	Feb 1, Feb 8
Asymptotic normality of the MLE and its cousins	Feb 15 22
Large sample tests	Mar 1
U statistics	Mar 8, 15
Exam 1	Mar 10, exact
Statistical functional	Mar 22
Jackknife	Mar 29
Bootstrap	April 5
Exam 2	April 14, exact
Nonparametric function estimation	April 12, 19
FINAL	TBA

**Statement of University's Honesty Policy:** At the University of Florida, each student is bound by the academic honesty guidelines of the University and the student conduct code printed in the Student Guide and on the University website. The Honor Code states: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." Cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior. Students are expected to act in accordance with the University of Florida policy on academic integrity (see Student Conduct Code, the Graduate Student Handbook or this web site for more details: <http://www.dso.ufl.edu/sccr/>).

**Academic integrity:** Students are encouraged to discuss the material with other members of the class on homework and other assignments. However, these are **NOT** allowed:

- Have another person complete any assignment in this course
- Copy another student's work on any assignment in this course
- Use materials provided by a previous student in the course for any purpose

**Policy Related to Class Attendance:** Class attendance is mandatory. Excused absences follow the criteria of the UF Graduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed class day when possible. UF rules require attendance during the first two course sessions. Regardless of attendance, students are responsible for all material presented in class and meeting the scheduled due dates for class assignments. Finally, students should read the notes from lectures given in earlier classes prior to the class meetings, and be prepared to discuss the material in class.

**Classroom etiquette:** Please come to class on time and be prepared to stay until the time scheduled as the end of class. Pagers and cell phones should not be used in class. The use of cell phones, text messaging, and pagers is a common complaint from students. Please turn them off. Another common complaint is "side" conversations among students. Please consider that your conversation may interrupt the attention of someone seated near you. Generally, you should be speaking to the class as a whole or participating in group discussions as directed by the instructor. I welcome in-class questions. Your question will nearly always be one that other students also have.

**Policy Related to Make-up Exams or Other Work:** Students are allowed to make up work ONLY as the result of illness or other unanticipated circumstances warranting a medical excuse and resulting in the student missing a homework or project deadline, consistent with College policy. Documentation from a health care provider is required. Work missed for any other reason will receive a grade of zero.

**Accommodations for Students with Disabilities:** If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (<http://www.dso.ufl.edu/>). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

**Counseling and Student Health:** Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171.

Visit their web sites for more information: <http://www.counsel.ufl.edu/> or <http://www.shcc.ufl.edu/smhs/help.shtml>

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: [www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc)

Crisis intervention is always available 24/7 from Alachua County Crisis Center: (352) 264-6789.

*BUT – Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.*