

**University of Florida**  
**College of Public Health & Health Professions Syllabus**

**STA6177: Applied Survival Analysis (3 credit hours)**

Fall 2024

Delivery Format: On-campus

Course Website: <http://elearning.ufl.edu/>

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Instructor Name: Jonathan Fischer, PhD

Room Number: HPNP G210

Meeting Times: Mon 4:05-4:55 PM and Tue 3:00-4:55 PM

Phone Number: 352-294-5459

Email Address: [jfischer1@ufl.edu](mailto:jfischer1@ufl.edu)

Office Hours: TBA

Teaching Assistants: TBA

Preferred Course Communications:

- To ask specific questions or discuss issues of a personal nature, please use the Canvas inbox in E-learning.
- To ask general questions, please post on the discussion board in E-learning.
- **NOTE: My email address is [jfischer1@ufl.edu](mailto:jfischer1@ufl.edu). There is another person with a nearly identical name and similar email address. Consequently, I prefer you use the Canvas inbox. However, if you need to email me directly, be sure to use the correct address as shown here. I typically respond to questions within one business day, so please verify that you used the correct address if you don't receive a response in that time.**

#### **Prerequisites**

Some exposure to linear algebra, statistical theory, and at least one course in regression methods. Knowledge of generalized linear models is preferable.

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## **PURPOSE AND OUTCOME**

### **Course Overview**

This course discusses the analysis of time-to-event data with an emphasis on responses to treatment, relapses of a disease, or death. We will introduce the basic concepts and statistical methods used for survival data, including methods from the parametric, semi-parametric, and non-parametric domains. Statistical analyses will be performed using R.

### **Relation to Program Outcomes**

This course provides the knowledge to interpret and apply biostatistical methods needed to analyze time-to-event data. It is primarily intended as a core course for MS students or a first survival analysis course for PhD students.

### **Course Objectives and/or Goals**

Upon successful completion of this course, students will be able to

- 1) Apply and interpret one sample methods for survival data including the Kaplan-Meier and Nelson-Aalen estimators.
- 2) Apply and interpret methods to compare two or more groups with a time-to-event response, including the log-rank test and its weighted editions.
- 3) Apply, build, and interpret regression models for survival data including the accelerated failure time model, Cox model, and related extensions.
- 4) Apply and interpret model diagnostics for regression models with survival data.

### **What is expected of you?**

You are expected to actively engage in the course throughout the semester. You must come to class prepared by completing all out-of-class assignments. This preparation gives you the knowledge or practice needed to engage in higher levels of learning during the live class sessions. If you are not prepared for the face-to-face sessions, you may struggle to keep pace with the activities occurring in the live sessions, and it is unlikely that you will reach the higher

learning goals of the course. Similarly, you are expected to actively participate in the live class. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

## DESCRIPTION OF COURSE CONTENT

### Topical Outline/Course Schedule

Week	Topics	Due
1 8/19-8/23	Probabilities and estimation for epidemiology	
2 8/26-8/30	Censoring, key functions and distributions in survival analysis	
3 9/2-9/6	Kaplan-Meier and Nelson-Aalen estimators	
4 9/9-9/13	Parametric regression models	Tue 9/10: - HW 1 (Weeks 1-3)
5 9/16-9/20	The log-rank test and the Cox model	
6 9/23-9/27	Breaking ties and estimation of the baseline hazard function	
7 9/30-10/4	Building Cox models	Tue 10/1: - HW 2 (Weeks 4-6)
8 10/7-10/11	Regression residuals and diagnostics	
9 10/14-10/18	Time-dependence and frailty terms	Tue 10/15: - HW 3 (Weeks 7-8)
10 10/21-10/25	Midterm exam	Wed 10/23: - Midterm exam (Weeks 1-8)
11 10/28-11/1	Stratification	Tue 10/29: - HW 4 (Week 9)
12 11/4-11/8	Recurrent events and competing risks	Tue 11/5: - Report proposals
13 11/11-11/15	Matching and weighting	Tue 11/12: - HW 5 (Weeks 11-12)
14 11/18-11/22	Survival analysis in clinical trials	Fri 11/22: - HW 6 (Weeks 13-14)
15 11/25-12/1	Happy Thanksgiving!	
16 12/2-12/6	Review and wrap-up	Wed 12/3: - Written report and code
Final exam week	Final exam	Wed 12/10: - Final exam (cumulative)

### Course Materials and Technology

All course lecture and review materials are available online through **Canvas** (<http://clearning.ufl.edu>). You will also need access to the statistical software package R (see details below). There is no required textbook to purchase for this course. However, the following textbooks may serve as useful references with additional examples/exercises:

- Applied Survival Analysis, 2nd edition by David W. Hosmer, Stanley Lemeshow, and Susanne May (Wiley-Interscience, 2008)
- Modelling Survival Data in Medical Research, 3rd edition by David Collett (Chapman and Hall/CRC, 2014)

### Statistical Software

#### R

The current version of R R 4.4.1. R is available for free and can be downloaded at <https://www.r-project.org/>. RStudio is also free, and it can be downloaded at <https://posit.co/download/rstudio-desktop/>.

#### E-learning

An E-Learning site is available for the course (<http://clearning.ufl.edu>). **The weekly schedule and all course materials are available online through this site including grades, assignments, discussions boards, and other course information. It is very important to check the weekly page and review all announcements carefully.**

For technical support for this class unrelated to course content, please contact the UF Help Desk at:

- [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)
- (352) 392-HELP - select option 2
- <https://helpdesk.ufl.edu/>

### Additional Academic Resources

- [Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.
- [Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- [Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)
- On-Line Students Complaints: [View the Distance Learning Student Complaint Process](#)
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): [View the Student Complaint Procedure webpage for more information.](#)

## ACADEMIC REQUIREMENTS AND GRADING

### Assignments

All assignment types described below will be submitted via Canvas.

### Exams

There will be one midterm exam as well as a cumulative final exam. These exams are not designed to take the entire respective exam windows and will focus on fundamental concepts of the relevant material rather than highly technical details. Exams will likely be closed-note with questions supplying additional information as necessary, and they will likely not include coding components.

### Homework

Homework assignments will be assigned roughly every 2 weeks and consist primarily of R coding and analysis exercises based on the material covered during recent weeks. There will occasionally be short calculations to be done by hand.

Homework assignments are open-note and will allow students to consider the material more deeply than exams. Homework will be graded for accuracy.

### Self-guided data analysis

Each student will perform a self-guided data analysis consisting of an initial proposal, annotated code, and a well-formatted written report discussing the results using a dataset chosen by the student. Further guidance regarding data set selection and a grading rubric will be provided in advance of the proposal due date.

### Grading

Assignment type	Number	Percent of final grade
Homework	6	36%
Data analysis proposal	1	4%
Data analysis report	1	15%
Data analysis code	1	5%
Midterm exam	1	15%
Final exam	1	25%
<b>Total</b>		<b>100%</b>

Percentage Earned	Letter Grade	Grade Points
[93, 100]	A	4.0
[90, 93)	A-	3.67
[87, 90)	B+	3.33
[83, 87)	B	3.0
[80, 83)	B-	2.67
[77, 80)	C+	2.33
[73, 77)	C	2.0
[70, 73)	C-	1.67
[67, 70)	D+	1.33
[63, 67)	D	1.0
[60, 63)	D-	0.67
<60	E	0.0
-	WF	0.0
-	I	0.0
-	NG	0.0
-	S-U	0.0

Please be aware that a C- is not an acceptable grade for graduate students. The GPA for graduate students must be 3.0 based on 5000 level courses and above to graduate. A grade of C counts toward a graduate degree only if based on credits in courses numbered 5000 or higher that have been earned with a B+ or higher.

More information on UF grading policy may be found at: <https://gradcatalog.ufl.edu/graduate/regulations/#Grades>.

### Exam Policy

Exams will be taken in Canvas using a proctoring service such as Honorlock. There will be some flexibility in the timing of each exam within a 24-hour period. Further relevant details will be provided closer to the exam dates.

### **Policy Related to Make Up Exams or Other Work**

All work is expected to be submitted on Canvas by the specified due date and time. Assignments submitted one day late will be accepted at a grade penalty of 10% of the maximum points available for each day late unless arrangements have been made ahead of time with the instructor. Exams are exempt from this policy and will not be accepted late. Late submissions without penalty are available only due to illness or other unanticipated circumstances, consistent with College policy. Be prepared to provide documentation from a health care provider in such cases (e.g., a doctor's note or correspondence with the UF Computing help desk). You should email me within 24 hours of the original due date in these circumstances.

### **Policy Related to Required Class Attendance**

Please note all faculty are bound by the UF policy for excused absences. For information regarding the UF attendance policies, see the Graduate Catalog (<https://gradcatalog.ufl.edu/graduate/regulations/#Attendance%20Policies>). I do not take formal attendance, though attendance and participation are expected parts of the course. Please arrive on-time for class meetings to the extent possible.

## **STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT**

### **Expectations Regarding Course Behavior**

It's critical to review the weekly page in Canvas and read all announcements carefully. Each week's materials will be clearly identified on the course E-learning site. Students are expected to work through the material as scheduled. It is very important to work through all content contained on this site as directed and ask questions about the material you do not understand. Working through the content from start to finish is the best approach to achieve a high level of understanding and success in this course. In addition, it is your responsibility to review the comments and feedback we give on your graded assignments. Cell phones should not be used in class, and computers are only permissible for class-related activities.

### **Communications Guidelines**

Questions about course material should be asked during office hours or posted on the course discussion boards in E-Learning. Questions about specific quiz questions or issues of a personal nature should be sent by email through E-Learning. For questions asked Monday-Thursday, we will try our best to respond within 24 hours. For questions asked Friday-Sunday, we will respond by Monday or as soon as possible thereafter. Additionally, please review the UF guidelines for online communications: <https://teach.ufl.edu/wp-content/uploads/2020/04/NetiquetteGuideforOnlineCourses.docx>

### **Academic Integrity**

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

**“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”**

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

**“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”**

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Handbook for additional details:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

<https://graduateschool.ufl.edu/work/handbook/>

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

### **Recording Within the Course**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

#### **Policy Related to Guests Attending Class**

Only registered students are permitted to attend class. However, we recognize that students who are caretakers may face occasional unexpected challenges creating attendance barriers. Therefore, by exception, a department chair or his or her designee (e.g., instructors) may grant a student permission to bring a guest(s) for a total of two class sessions per semester. This is two sessions total across all courses. No further extensions will be granted. Please note that guests are **not** permitted to attend either cadaver or wet labs. Students are responsible for course material regardless of attendance. For additional information, please review the Classroom Guests of Students policy in its entirety. Link to full policy: <https://phhp.ufl.edu/policy-classroom-guests-of-students/>

#### **Online Faculty Course Evaluation Process**

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## **SUPPORT SERVICES**

#### **Accommodations for Students with Disabilities**

If you require classroom accommodation because of a disability, it is strongly recommended you register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class or as soon as you believe you might be eligible for accommodations. The Dean of Students Office will provide documentation of accommodations to you, which you must then give to me as the instructor of the course to receive accommodations. Please do this as soon as possible after you receive the letter. Students with disabilities should follow this procedure as early as possible in the semester. The College is committed to providing reasonable accommodations to assist students in their coursework.

#### **Counseling and Student Health**

Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- U Matter, We Care: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- Counseling and Wellness Center: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center website](#).
- University Police Department: Visit [UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the [UF Health Emergency Room and Trauma Center website](#).
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-2734450.

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.

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### **Inclusive Learning Environment**

Public health and health professions are based on the belief in human dignity and on respect for the individual. As we share our personal beliefs inside or outside of the classroom, it is always with the understanding that we value and respect diversity of background, experience, and opinion, where every individual feels valued. We believe in, and promote, openness and tolerance of differences in ethnicity and culture, and we respect differing personal, spiritual, religious, and political values. We further believe that celebrating such diversity enriches the quality of the educational experiences we provide our students and enhances our own personal and professional relationships. We embrace The University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act."

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