

COURSE SYLLABUS

COURSE NAME: **BIostatistics 101 / BIOS 101 for Cancer Researchers**
 LOCATION: All lectures presented online using Zoom
 CLASS DATES: Wednesday, January 11, 2023 – Wednesday, April 26, 2023
 CLASS HOURS: 3:00 PM – 3:55 PM

COURSE GOAL	Introduce the basic statistical concepts and methods for cancer research.		
BACKGROUND	Understanding the fundamentals of biostatistics is important for any type of cancer research. <i>BIostatistics 101 / BIOS 101 for Cancer Researchers</i> at Moffitt is an overview of these fundamentals. The lectures and provided materials introduce the basic principles of biostatistics and are intended for individuals desiring a stronger understanding.		
COURSE DESCRIPTION	The lecture series will cover the following topics: descriptive statistics, hypothesis testing, power estimation, tests comparing group means, correlation and regression, statistical modeling, survival analysis, clinical trials, and behavior research. There will be 15 lectures, with initial lectures covering all topics at an introductory level and later lectures providing more details on a subset of topics.		
WHO WILL TAKE THIS COURSE?	Clinicians, Fellows, Cancer Researchers, and Cancer Biology Students. * Note: Only Moffitt Members are eligible. Exceptional cases may be discussed with the Administrative Coordinator prior to the registration deadline.		
PREREQUISITES	None		
REGISTRATION POLICY	There is no fee for this lecture series. Attendees must self-register at http://bio2.moffitt.org/lms by 5 PM Eastern Time on Friday, January 6, 2021. Please e-mail Bio2Admin@moffitt.org if you have any registration questions. Only registered students can access the lectures and course materials online.		
COURSE MATERIALS	The lecture slides will be posted on the course website before each class. The supplemental materials will be posted at the start of the course with edits and additions likely.		
LECTURE QUIZ	There will be a quiz covering the material presented in the lecture. The responses will be T/F or multiple choice. The quiz is due by 11:59 PM (Eastern Time) the following Tuesday.		
CLASS CERTIFICATION	Completing 10 out of 15 quizzes with a passing score (60% or higher) is required to receive the class certification.		
COURSE LOCATION	Remote course presentation and attendance via Zoom. The link will be included in the calendar invitation for each lecture sent to those enrolled. Please e-mail Bio2admin@moffitt.org if you have any questions.		
COURSE EVALUATION	A course evaluation form will be made available online after the 8 th and the last lecture. There will be opportunities to provide evaluations for guest lecturers.		
COURSE DIRECTOR	Steve Sutton, PhD Associate Member Department of Biostatistics and Bioinformatics steve.sutton@moffitt.org Tel: (813) 745-6524	COURSE ADMINISTRATIVE COORDINATOR	Keona McDonald Executive Assistant Department of Biostatistics and Bioinformatics keona.mcdonald@moffitt.org Tel: (813) 745-0198

COURSE SCHEDULE / DESCRIPTION

Date	Instructor	Title	Contents
01/11/2023	Steve Sutton	Introduction	<ul style="list-style-type: none"> • Statistics within research • Data types and variable types • Probability
01/18/2023	Steve Sutton	Descriptive statistics	<ul style="list-style-type: none"> • Central tendency, variability, and shape • Sampling distributions
01/25/2023	Steve Sutton	Visualization	<ul style="list-style-type: none"> • Histograms • Stem-and-leaf plots • Scatter plots
02/01/2023	Steve Sutton	Parameter estimation	<ul style="list-style-type: none"> • Statistical inference logic • Point estimation • Confidence interval estimation • <i>bootstrapping</i>
02/08/2023	Steve Sutton	Hypothesis testing	<ul style="list-style-type: none"> • Hypothesis testing logic • Type I/II errors • P-value and statistical significance • Statistical power
02/15/2023	Steve Sutton	Basic inferential statistics - 1	<ul style="list-style-type: none"> • Chi-square (χ^2) test • Fisher's exact test • McNemar's test
02/22/2023	Steve Sutton	Basic inferential statistics - 2	<ul style="list-style-type: none"> • T-test • ANOVA
03/01/2023	Steve Sutton	Basic inferential statistics - 3	<ul style="list-style-type: none"> • Correlation • Univariate regression
03/08/2023	Steve Sutton	Model building	<ul style="list-style-type: none"> • Multiple linear regression • Multiple logistic regression
03/15/2023	USF Spring break		
03/22/2023	Steve Sutton	Longitudinal data analysis (LDA)	<ul style="list-style-type: none"> • Mixed models, growth curve models • Generalized estimating equations • Intensive LDA
03/29/2023	Steve Sutton	Principle components analysis (PCA)	<ul style="list-style-type: none"> • Multidimensional data reduction • Psychometrics
04/05/2023	Steve Sutton	Issues for observational research	<ul style="list-style-type: none"> • Multiple testing • Managing incomplete data sets • Multi-level models
04/12/2023	Michael Schell	Overview of clinical trials	<ul style="list-style-type: none"> • Concepts of Phase I, II, III, and IV • Phase I trials: 3+3, BOIN, & CRM designs • Phase II trials: Simon's two stage design
04/19/2023	Steve Sutton	Survival analysis	<ul style="list-style-type: none"> • Kaplan-Meier curve • Log-rank test • Cox proportional hazards regression
04/26/2023	Bob Gore	Bayesian statistics	<ul style="list-style-type: none"> • Introduction • Contrast with frequentist statistics