

Biomedical Data Modeling (Math 6397-05)
Spring 2019
Class# 14281

Instructor	Binod Manandhar Office : PGH 214 Email : binod@math.uh.edu
Class meets	CBB 214 Day/Time : Tue and Thu, 4:00 pm - 5:30 pm Dates: 1/14/2019 - 5/9/2019
Prerequisites	MATH 6358 or equivalent linear regression analysis, a probability class, and at list familiar with one programming language or consent of a instructor
Office Hours	Tue and Thu, 2:30 pm - 3:45 pm Or by appointment.
Text Book	Clinical Trial Data Analysis Using R and SAS (2nd Edition) by Ding-Geng (Din) Chen, Karl E. Peace, Pinggao Zhang ISBN 9781498779524 Survival Analysis: A Practical Approach (2nd Edition) by David Machin, Yin Bun Cheung, and Mahesh Parmar ISBN-13: 978-0470870402
Courses	This graduate level course is designed for students who have been exposed to some statistical tools before and interested in medical data, clinical trials, and biostatistics. Student in this course will gain experiences in several statistical methods frequently seen in biomedical applications with software implementation in R. The topics will include test of location (parametric and non-parametric); Survival analysis, longitudinal data analysis, and Bayesian models.
List of Topics	<ul style="list-style-type: none">• Treatment comparison in clinical trials (two sample t-test, MANOVA, Chi-square test, and briefly on the non-parametric tests)• Survival Analysis Survival curves, Comparison of two survival curves, Cox's proportional Hazards models• Longitudinal Data Analysis (Linear mixed model, Generalized Linear mixed model, Generalized estimating equation)• Statistical models incorporating covariates (ANCOVA, Logistic regression, Poisson Regression, Overdispersion)• Random effects• Bayesian method
Grading	Final grades will be computed based on number of assignments (due in class every week) , two in class midterms, and a final oral presentation. You need to submit attached R code with your assignment. If submitted assignments are not readable, or only final answers are provided without works then you may not get credit for that. In class midterm exams are close books, close notes, however you are allowed to have a page of cheat sheet written one side only. Homework, mid-terms solution will be posted on the blackboard.

Homework - 35%
First Mid-term - 20 %
Second Mid-term - 20 %
Final presentation - 25%

Final letter grads will be determined as an overall percentage of points earned on assignments, in class exam and final presentation. The anticipated grade cut-off are as follows:

Percent	Grade	Percent	Grade
94	A	80	B-
90	A-	77	C+
87	B+	73	C
83	B	70	C-

Final Oral Presentation Final presentation is a group work (2-3 students) for twelve minutes at the final week of the semester. Each group has to present a relevant research paper published on biomedical field. Each group has to inform me about selected research paper to present. We will set up meetings to discuss more about final group presentation. Final presentation will be graded on your understanding, presentation and answers at the end of your presentation.

Extra Credit There will be no extra credit.

R software R is a open source statistical analysis software, and can be downloaded for free at <https://www.r-project.org/>

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http://www.uh.edu/caps/outreach/lets_talk.html