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

Instructor  
Binod Manandhar  
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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 an 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  

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  
- 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:

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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/

UH CAPS Statement
Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the Let’s Talk program, a drop-in consultation service at convenient locations and hours around campus.
http://www.uh.edu/caps/outreach/lets_talk.html