Non-Linear Regression-2025 (MTH-686)

In this semester we will be having around 35 lectures. Our classes are on Monday, Tuesday and Thursday from 4:00 pm to 4:50 pm in L-1. Keep yourself free on every Thursday from 6:00 pm to 6:50 pm, in case I need to take extra classes if I miss some classes.

In the first few lectures I will review the linear regression techniques. Emphasis will be on some non-standard linear regression techniques. Then we will move to the non-linear regression analysis. What is the definition of a non-linear regression model? What are the similarity and differences with the standard linear regression mode? What is the limitations of this course? Different estimation techniques under various conditions will be discussed. Asymptotic properties of the different estimators will be derived. Computational algorithms will be discussed. This course is quite different than a typical statistics course. You will find lots of applications, theories and computational techniques in this course. Hope you will enjoy this course.

Suggested reading materials:

1. G.A.F. Seber and C.J. Wild (1989), Nonlinear Regression, Wiley Interscience.
2. D. M. Bates and D. G. Watts (1988), Nonlinear Regression Analysis and Its Applications, Wiley Interscience.
3. Some research papers.

The course will be evaluated by best four (out of five) quizzes, one mid-term, one individual project and one final examination. The five quizzes will take place (a) August 21, 2025 (b) Sept. 11, 2025 (c) Oct. 16, 2025, (d) November 06, 2025 and (e) November 13, 2025. There will no makeup quiz. If any body misses any quiz, it will be replaced by 0. All the quizzes will take place in the evening. The venue will be announced in due course of time. The final grade will be based on: Quiz (20%), Mid-Sem (25%), Project (15%) and Final (40%). I will give the project after the mid-sem and the project will be due on November 09, 2025 (7 pm). If you submit after that 5 marks will be deducted. I will NOT accept any project after November 10, 2025 (7 pm). The project has to be submitted in typed form (hard copy). If I see any copying (or any unfair means) in any quiz, mid-sem, project or in the final, all the concerned person(s) will be deregistered immediately and the matter may be reported to SSAC.

It is expected that the students have some background on Linear Regression and Statistical Inference. The project will be based on computational algorithm (any language can be used), and one needs to implement the algorithm.