Department of Management Studies, Indian Institute of Science

MG 226, Advanced Analytics, 2020

This course will be offered in two parts. The part offered by Dr. Abhinanda Sarkar [(sarkar.abhinanda@gmail.com)](mailto:(sarkar.abhinanda@gmail.com)) is described below.

**Schedule:** There are expected to be four or more teaching sessions, to be decided by mutual convenience. .

**Topics:** The course will focus on a connected set of statistical methods inspired by computational advances. Translation to management applications will be indicated as well, as per class interests. The intended set of topics is below.

- Exponential families and generalized linear models (GLM)

- GLM for classification (logistic regression) and survival analysis (Cox regression)

- GLM regularization and variable selection using ridge regression and lasso

- Inference and prediction in logistic regression and survival analysis

**Grading:** There are expected be two graded components: (1) a take-home assignment and (2) an in-class exam.

**Prerequisites:** The course assumes that students have taken a first year masters course in statistics. The corresponding maturity in probability, statistical inference, calculus, linear algebra, and optimization will be expected. In addition, some familiarity with R will be assumed.

**Reading:** The course will have no formal textbook. References will be suggested in class. Sessions will include board-based discussions and interactive R demonstrations. The following, available at https://web.stanford.edu/~hastie/, are quite relevant.

Efron and Hastie (2016), *Computer Age Statistical Inference: Algorithms, Evidence, and Data Science*

Hastie and Qian (2016), *Glmnet Vignette*