



Course Syllabus: Advanced Statistical Inference - STAT 320

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	STAT 320
Course Title	Advanced Statistical Inference
Academic Semester	Spring
Academic Year	2017/2018
Semester Start Date	01/28/2018
Semester End Date	05/24/2018
Class Schedule (Days & Time)	01:00 PM - 02:30 PM Mon Thu

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Haavard Rue	HAAVARD.RUE@KAUST.ED U.SA			by appointment.

Teaching Assistant(s)

Name	Email
------	-------

Course Information

Comprehensive Course Description	Statistical inference in a wide range of problems at an advanced level. It covers general theory of frequentistic and Bayesian point estimation, tests and confidence intervals, and robust estimation. We will base the lectures on the books -Essential Statistical Inference, by D.D.Boos and L.A.Steafanski, Springer (Chapters 1,2,3,5,6) -The Bayesian Choice, by C.P.Robert, Springer (Chapters 1,2,3,4,5)
Course Description from Program Guide	Statistical inference in a wide range of problems at an advanced level. It covers the general theory of estimation, tests and confidence intervals by deriving in particular the asymptotic properties of the maximum likelihood estimator and the likelihood ratio, Wald and scores tests (and their generalizations) and the calculus of M-estimation. Selected modern topics such as Bayesian and permutation inference, rank tests, the jackknife and the bootstrap.
Goals and Objectives	The object for this course, is that the student should learn and master the basic techniques and results, for statistical inference both in the frequentistic and Bayesian framework.
Required Knowledge	STAT 220, 230, 240, 250
Reference Texts	-Essential Statistical Inference, by D.D.Boos and L.A.Stefanski, Springer -The Bayesian Choice, by C.P.Robert, Springer Both books are available as e-books at KAUST library.
Method of evaluation	60.00% - Final exam 40.00% - Homework /Assignments
Nature of the assignments	The assignments will consist of problems from the book and others.
Course Policies	Grades will be posted on the course website and may be disputed only within 48 hours

Additional Information**Tentative Course Schedule***(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Mon 01/29/2018 Thu 02/01/2018	Frequentist inference. Chapter 1
2	Mon 02/05/2018 Thu 02/08/2018	Frequentist inference. Chapter 2
3	Mon 02/12/2018 Thu 02/15/2018	Frequentist inference. Chapter 2
4	Mon 02/19/2018 Thu 02/22/2018	Frequentist inference. Chapter 3
5	Mon 02/26/2018 Thu 03/01/2018	Frequentist inference. Chapter 3
6	Mon 03/05/2018 Thu 03/08/2018	Frequentist inference. Chapter 5
7	Mon 03/12/2018 Thu 03/15/2018	Frequentist inference. Chapter 5
8	Mon 03/19/2018 Thu 03/22/2018	Frequentist inference. Chapter 6
9	Mon 03/26/2018 Thu 03/29/2018	Bayesian inference. Chapter 1
10	Mon 04/02/2018 Thu 04/05/2018	Bayesian inference. Chapter 2
11	Mon 04/09/2018 Thu 04/12/2018	Bayesian inference. Chapter 2
12	Mon 04/16/2018 Thu 04/19/2018	Bayesian inference. Chapter 3
13	Mon 04/23/2018 Thu 04/26/2018	Bayesian inference. Chapter 3
14	Mon 04/30/2018 Thu 05/03/2018	Bayesian inference. Chapter 4
15	Mon 05/07/2018 Thu 05/10/2018	Bayesian inference. Chapter 4
16	Mon 05/14/2018 Thu 05/17/2018	Bayesian inference. Chapter 5
17	Mon 05/21/2018 Thu 05/24/2018	Bayesian inference. Chapter 5
18		

Note

The instructor reserves the right to make changes to this syllabus as necessary.