Statistical and Optimizations Tools
CNST 6307

General
Course Instructor:	Dr. A. Senouci, Ph.D.	
Course Time:	11:30 am -1:00 pm	Tuesday and Thursday @T-131
Office Hours:	10:00-11:00 am	Tuesday and Thursday @ Building-T1-111A
		or by appointment
Contact Hours:	Email: asenouci@uh.edu	
	Tel: 713-743-6131	

Course Description
The course introduces the fundamental concepts and methods of statistics and covers topics ranging from descriptive statistics, sampling distributions, confidence intervals, hypothesis testing. Topics could include simple and multiple linear regression, and Analysis of Variance. The course also introduces the fundamental concepts and methods of optimization and covers how to formulate basic models using linear programming, dynamic programming, genetic algorithms, and ant colony for decision problems where multiple decision need to be made in the best possible way, while simultaneously satisfying a number of logical conditions (or constraints).

Course Prerequisites
Department Approval

Learning Objectives
Upon the completion of this course, students should be able to demonstrate the ability to:
1. Have an understanding of the fundamental concepts and methods of statistics.
2. Have an understanding of the fundamental concepts of optimization.
3. Have an introductory knowledge on linear programming, dynamic programming, genetic algorithms, and ant colony.

References
Richard Scheaffer, Madhuri Mulekar, and James McClave (2010). Probability and Statistics for Engineers, 5th edition, Brooks/Cole CENGAGE Learning.
Steven Chapra and Raymond Canale (2014). Numerical Methods, 7th edition, McGraw-Hill Education
Richard Bellman (2003). Dynamic Programming, Dover Publication, Mineola, New York.
David Goldberg (1989). Genetic Algorithms in Search, Optimization, and Machine Learning, Addison-Wesley Professional.

Grading
Assignments	35%
Exam#1	35%
Exam#2	35%

Grading Scale

Letter Grade	Score	Letter Grade	Score
A	100-93%	C^+	79-76%
A^-	92-90%	C	75-73%
B^+	89-86%	C^-	72-70%
B	85-83%	D^+	69-66%
B^-	82-80%	D	65-60%
		F	$< 60\%$

Note: During the semester, students are responsible for verification of correct score for their assignments, quizzes, and midterm exams. No corrections/modifications will take place after the last class.

SCHEDULE OF TOPICS*

Week#	Lecture Topic	Slide Chapters
1-2	Univariate and Bivariate Distributions	Chapter 1
3	Statistics and Sampling Distributions	Chapter 2
4	Estimation	Chapter 3
5	Hypothesis Testing	Chapter 4
6	ANOVA	Chapter 5
7-9	Regression Analysis	Chapter 6
10	Introduction to Optimization Methods	Chapter 7
11	Linear Programming	Chapter 8
12	Dynamic Programming	Chapter 9
13	Genetic Algorithms	Chapter 10
14	Ant-Colony Optimization	Chapter 11

*May subject to change

Academic Honesty

The instructor reserves the right to adjust letter grades, upward only, based on individual attendance and class participation if numerical grade warrants such consideration. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from The University. Since dishonesty harms the individual, all students, and the integrity of The University, policies on scholastic dishonesty will be strictly enforced.

Students with Disabilities

University of Houston provides, upon request, appropriate academic adjustments for qualified students with disabilities. Any student with a documented disability (physical or cognitive) who requires academic accommodations should contact the Center for Students with Disabilities (713/743-5400) for more assistance.

Exam Policy

Exams will include material covered in class discussions and homework assignments. Make-up exams will be given only in the event of a verified emergency or doctor-verified sickness. The student is responsible for all reading assignments and class handouts whether or not covered in class or listed on the syllabus.

Course/Instructor Evaluation

A course/instructor evaluation will be conducted in class during the last scheduled lecture. Any suggestions you have on improving the course, however, are welcome throughout the term. For detailed information about Disabilities, Religious Holy Days, the Academic Calendar, and Academic Honesty, and other information, please visit the UH website:

http://www.uh.edu/provost/stu/stu_syllabsuppl.html

UH CAPS Statement

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to the demands of a professional program, or feeling sad and hopeless. You can reach CAPS (UH main campus **www.uh.edu/caps**, or UH Sugar Land campus **http://www.uh.edu/dsaes/uhsugarland/**) 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.
UH main campus **http://www.uh.edu/caps/outreach/lets_talk.html**.
UH Sugar Land campus **http://www.uh.edu/dsaes/uhsugarland/**.