A) COURSE

Course Id:	Course
5643	PROBABILITY AND STATISTICS FOR ENGINEERS

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
5	0	5	10	80

B) GENERAL COURSE INFORMATION:

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:	III	III	VI	V	IV
Course Type (Required/Elective)	REQUIRED	REQUIRED	REQUIRED	REQUIRED	REQUIRED
Prerequisite Course:	ALGEBRA A	ALGEBRA B	ALGEBRA A	ALGEBRA B	ALGEBRA A
CACEI Classification:	CI	CI	CI	CI	CI

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:
The student will solve problems involving random phenomena, applying the most appropriate probabilistic models, also have the ability to organize, analyze and present statistical information at your reach, inferring the most notable characteristics of a population and so can make the decision that allows implementing the best solution to the problem. Complementing the student will have the ability to use and interpret the outputs of some XLSTAT statistical software such as Minitab, etc

D) TOPICS (CONTENTS AND METHODOLOGY)

1 . Introduction to probability and statistics		3 Hours
Specific Objective:	Students will learn the basic concepts of probability and statistics, distinguishing between descriptive statistics and statistical inference, and displayed the importance of these tools	
1.1 Concept of Statistics. 1.2 Probability Concepts. 1.3 Branches of Statistics.		
Readings and other resources	Books, Articles, Further literature, Internet Links.	
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.	
Learning Activities		

2.- Descriptive Statistics		20 Hours
Specific Objective:	The student will achieve a first understanding of how and few sample pieces, known measures of central tendency and dispersion as well as the relationship between them, you can get the real limits of a process and may develop and interpret histograms.	

2.1 Theory of Sampling. 2.1.1 Sampling, Simple random, stratified, cluster. 2.1.2 Methods of gathering information sampling. 2.2 Measures of Central Tendency: Mean, Median, Mode, Geometric Mean,Harmonic Mean, quartiles, and percentiles. 2.3 Measures of Dispersion: Range, standard deviation, variance 2.5. Frequency Distributions, Histograms and Types Stem-and-Leaf 2.6 Random Sampling,	
Readings and other resources	Books, Articles, Further literature, Internet Links.
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.
Learning Activities	

3. - Introduction to Probability	**8 Hours**
Specific Objective:	Identify the main concepts of probability and its importance in statistical quality control and knows the main characteristics of the different probability distributions and their application.
3.1 Theory of Probability 3.1.1 Set Theory, operations, laws and their representation 3.1.2 Types of Event. 3.1.3 Sample Space. 3.1.4 Permutations and combinations. 3.1.5 Bayes Rule. 3.2 Random Variables and Distributions. Random 3.2.1Random variables and distribution functions. 3.2.2 Expected Value. 3.2.3 Distributions Bernoulli, Binomial, Poisson, Geometric, Normal (Central Limit Theorem), chi-square and student´s T.	
Readings and other resources	Books, Articles, Further literature, Internet Links.
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.
Learning Activities	

4.- Statistical Inference	**25 Hours**
Specific Objective:	The student will identify the main concepts of statistical inference and understood relationship between probability distributions and inference, develops inferences on time and interval as well as have the ability to establish hypothesis tests and take the test to accept or reject them, in this part of the course, students can compare processes and determine whether both processes operate statistically equal.
4.1 Application of chi-square distributions, T and F. 4.2 Spot Estimation and Confidence Intervals (mean, variance and proportion). 4.3 Testing of Hypothesis (mean and variance) and the hypothesis approach. 4.4 Testing Unilateral and Bilateral. 4.5 Errors Type I and Type II. 4.6 Acceptance or Rejection Criteria. 4.6.1 Critical Value vs Test Statistic. 4.6.2 Observed Significance Vs Significance Predefined. 4.6.3 Confidence Interval. 4.7 Hypothesis 2/2: Comparison of two processes or populations. 4.8 Test for equal variances. 4.9 Hypothesis tests for differences in proportions.	
Readings and other resources	Books, Articles, Further literature, Internet Links.
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.
Learning Activities	

5. - Regression and correlation analysis	**12 Hours**
Specific Objective:	The student determined from a series of data or variables if these can be set to linear or nonlinear models, through tools such as scatterplot least square method, multiple regression .

5.1 Simple and Multiple Linear Regression 5.1.1 Linear Regression 5.1.2. Correlation 5.1.3 The line of least squares. 5.2 Multiple Regression. The multiple regression model	
Readings and other resources	Books, Articles, Further literature, Internet Links.
Teaching Methodologies	Exhibition themes, concept analysis, problem resolution and discussion, group work and individual.
Learning Activities	

E) TEACHING AND LEARNING METHODOLOGIES

The class teacher will present to the group. Professor teach the subjects in class, so that the Students will construct concepts and procedures to develop a statistical thinking. Be important to present clear examples that show the importance of theory and applications. With these bases, should encourage generalization to perform exercises and the student can implement their knowledge. Students will perform tasks at home, work in the classroom doing some exercises both on the board and in his notebook. Student participation in the classroom is very important. The student must always use a scientific calculator, which must be used so that simplify the calculations and quickly interpret the results. The student will develop a final project application practice related to any of the following areas: Exploratory Data Analysis, Statistical Process Control, Six Sigma, Operations Management, Inventory Management, Financial Engineering, Market Research Green and Lean Enterprise.

F) EVALUATION CRITERIA:

Evaluation:	Schedule	Suggested Form of Evaluation and weighing	Topics
1er. Evaluation Partial	Session 16	Exam 70% , Homework 20%, Participation 10%	Unity 1 y 2
2º Evaluation Partial	Session 32	Exam 70% , Homework 20%, Participation 10%	Unity 2 y 3
3er. Evaluation Partial	Session 48	Exam 70% , Homework 20%, Participation 10%	Unity 3 y 4
4a. Evaluation Partial	Session 64	Exam 70% , Homework 20%, Participation 10%	Unity 4
Evaluation Final Ordinary	Session 80	Exam 70% , Homework 20%, Participation 10%	Unity 4 y 5
Other Activity:			
Exam Extraordinary	Week 17 of the semester in progress	100% Exam	100% Program
Exam of title	According to	100% Exam	100% Program

	schedule school secretary		
Exam regularization	According to schedule school secretary	100% Exam	100% Program

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

JAY L. DEVORE .
Probabilidad y Estadística para Ingeniería y Ciencias.
Ed. CENGAGE LEARNING. Sexta Edición
WILLIAM MENDENHALL, TERRY SINCHI
Probabilidad y Estadística par Ingeniería
Editorial Prentice Hall Hispanoamérica. Cuarta Edición
WILLIAM NAVIDI
Estadística para ingenieros
Editorial Mc. Graw Hill, 2006. Sexta. Edición.

COMPLEMENTARY BOOKS

J. SUSAN MILTON, JESEE C. ARNOLD
Probabilidad y Estadística para Ingeniería y Ciencias Computacionales.
Editorial Mc Graw Hill. 4a Ed. 2004.
RONALD E. WALPOLE, RAYMOND H. MYERS
Introducción a la probabilidad y estadística,
Editorial Pearson. 13va Edición –

WEB SITE

http://www.seissigma.com.mx
http://www.minitab.com/es-mx/
http://www.wolframalpha.com/
http://www.itl.nist.gov/div898/handbook/
Plataforma moodle: http://ame.uaslp.mx/moodle/index.php