



Module Title Applied Statistics in Manufacturing	Module Code MSDE 232	Semester (Sem 1 / Sem 2) Sem 2
Credits 10	Level 4	Professor and email Kwang Ho KOOK khkook@seoultech.ac.kr
Delivery Method Lecture	Delivery Location SeoulTech, Mugung Hall	

Module Synopsis

This module aims to provide the student with the basic concepts of statistics. The student will learn about the sample statistics, various sample distributions and their applications. This module will enable the students to perform statistical analysis of the data obtained in a manufacturing system. Assessment is through a final examination at the end of the course plus homework assignments.

Outline Syllabus

Overview of Applied Statistics

Introduction to the statistics. Terminologies and typical application areas of applied statistics.

Basic Concepts of Statistics

Graphical and numerical representation methods of the data. Introduction to the sample space, event and the probability.

Special Random Variables and Distributions

Definition of the random variable. Special discrete and continuous probability distributions such as Bernoulli, Binomial, Poisson, Normal and Exponential distributions.

Distributions of the Sampling Statistics

Central Limit Theorem. The sampling distributions of the sample mean and sample proportion.

Parameter Estimation

Point estimators. Confidence interval of the sample mean and sample proportion for one population and two populations.

Hypothesis Testing

Hypothesis testing for the population mean and population proportion when the sample size is small and large.

Regression

Prediction of the value of one variable from known values of other related variables. Simple linear regression and multiple linear regression.



Indicative Reading

1. Introduction to Probability and Statistics for Engineers and Scientists, S.M. Ross, Elsevier Academic Press, 4th edition.
2. The Art of R Programming: A Tour of Statistical Software Design, Norman Matloff.
3. <http://www.r-project.org> : R software can be downloaded freely.

NOTIONAL STUDENT WORKLOAD	Hours
MODE OF DELIVERY (FT / PT / DL)	FT
Lectures	35
Seminars	
Tutorials	
Laboratories/studios/practical	10
Directed learning	
Independent Learning	55
Work experience/fieldwork	
Other: eg formal presentation	
Total Workload 100 hours for a 10 credit module 200 hours for a 20 credit module	100

Module Outcomes

KU1,2	KU1. Demonstrate basic knowledge of the scientific and mathematical foundations of engineering to solve basic problems. KU2. Perform simple analysis of familiar engineering systems.
IPSA1,4	IPSA1. Demonstrate the use of fundamental approaches to solving readily defined engineering problems. IPSA4. Illustrate solutions to basic engineering problems.
PVA2	PVA2. Demonstrate creativity in discussing solutions to standard problems.



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MSDE Module Descriptor

Assessments	Assessment Type	Weighting %	Midterm/interim/final
Coursework	Assignment (5 times/ semester – 12 problems each)	20	Interim
Project			
Quiz	Quiz about the usage of R software	10	Midterm
Test			
Laboratory			
Exam	Final exam/ 2 hr	70	Final
Presentation			