Module code	TG-2307			
Module Title	Fundamental Statistics for Engineers			
Degree/Diploma	Bachelor of Engineering			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	8	hours/week
		Contact hours	4	hours/week
Prerequisite	SM-1201 Mathematical Methods for the Sciences			
Anti-requisite	SM-2205 Intermediate Statistics			

Aims

To equip statistical techniques and analysis from engineering point of view and their application in engineering problems

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- understand the basic concepts of Probability Theory, Random Variables, Distributions, and Estimation, emphasizing the link between Statistics and Engineering
Middle order :	60%	- apply problem solving approaches to learning or acquiring information of interest through sampling, and more generally through selecting trial configurations (designs) whose performance is to be observed or sampled
Higher order:	10%	-evaluate and asses the quality of statistical approaches -work independently and in a team

Module Contents

- Introduction & Treatment of data
- Sample spaces & events, counting, Probability, axioms of Probability
- Elementary Theorems, conditional probability, Bayes Theorem,
- Mathematical expectation & Decision Making
- Discrete Random Variables, Binomial & Hyper geometric Distribution
- Mean & variance of a probability distribution, Chebyshev's Theorem
- Poisson process, Poisson & Geometric distribution
- Continuous random variables, Normal distribution
- Normal approximation to Binomial & other probability densities, Uniform distribution
- Single sample, two independent samples, paired samples,
- Inference for normal means, hypothesis tests, type 1 and type 2 error rates, inference for proportions
- SPC, the Xbar chart, control limits, runs rules, process capability, general control charts, cusum charts
- regression and correlation, simple linear regression, least squares estimation, inference for regression coefficients, prediction and estimation, regression diagnostics
- multiple linear regression, least squares estimation, inference, prediction and estimation, diagnostics

Assessment	Formative assessment	Tutorial and feedback.
	Summative assessment	Examination: 60%
		Coursework: 40% - 2 class tests (10% each) - 2 assignments (10% each)