

<b>Module code</b>	TG-2307		
<b>Module Title</b>	Fundamental Statistics for Engineers		
<b>Degree/Diploma</b>	Bachelor of Engineering		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student Workload</b>	8 hours/week
		<b>Contact hours</b>	4 hours/week
<b>Prerequisite</b>	SM-1201 Mathematical Methods for the Sciences		
<b>Anti-requisite</b>	SM-2205 Intermediate Statistics		
<b>Aims</b>			
To equip statistical techniques and analysis from engineering point of view and their application in engineering problems			
<b>Learning Outcomes</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
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 assess the quality of statistical approaches -work independently and in a team	
<b>Module Contents</b>			
<ul style="list-style-type: none"> <li>• Introduction &amp; Treatment of data</li> <li>• Sample spaces &amp; events, counting, Probability, axioms of Probability</li> <li>• Elementary Theorems, conditional probability, Bayes Theorem,</li> <li>• Mathematical expectation &amp; Decision Making</li> <li>• Discrete Random Variables, Binomial &amp; Hyper geometric Distribution</li> <li>• Mean &amp; variance of a probability distribution, Chebyshev's Theorem</li> <li>• Poisson process, Poisson &amp; Geometric distribution</li> <li>• Continuous random variables, Normal distribution</li> <li>• Normal approximation to Binomial &amp; other probability densities, Uniform distribution</li> <li>• Single sample, two independent samples, paired samples,</li> <li>• Inference for normal means, hypothesis tests, type 1 and type 2 error rates, inference for proportions</li> <li>• SPC, the Xbar chart, control limits, runs rules, process capability, general control charts, cusum charts</li> <li>• regression and correlation, simple linear regression, least squares estimation, inference for regression coefficients, prediction and estimation, regression diagnostics</li> <li>• multiple linear regression, least squares estimation, inference, prediction and estimation, diagnostics</li> </ul>			
<b>Assessment</b>	Formative assessment	Tutorial and feedback.	
	Summative assessment	Examination: 60%	
		Coursework: 40%	
		- 2 class tests (10% each) - 2 assignments (10% each)	