

MATH 4130	<b>Probability &amp; Statistics</b>	3 Credit Hours
Prerequisites:	MATH 3120	
<b>Goal</b>	To provide the student with the basic knowledge of probability and statistics, along with practical applications to physical and engineering problems.	
<b>Objectives</b>		<b>Outcomes</b>
<p>This course should enable the student to:</p> <ol style="list-style-type: none"> <li>1. Understand the essential laws and principles governing the topics of probability and statistics.</li> <li>2. Grasp the basic concepts and ideas involved in probability and statistics.</li> <li>3. Conceive how to apply statistical methods and probability theory in practical situations.</li> <li>4. Possess the mathematical skills to link probabilistic and statistical concepts in dealing with a technical problem.</li> </ol>		<p>A student who satisfactory complete the course should be able to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the role of statistics in engineering applications.</li> <li>2. Determine the descriptive measures (mean, median, variance...etc.) of random variables and collected data.</li> <li>3. Accurately estimate population characteristics from small sample groups.</li> <li>4. Evaluate sample data to determine if process interventions are truly effective or to compare various system options before making final decisions.</li> <li>5. Recognize types of data and describe the data using tabular, graphical, and numerical representation.</li> <li>6. Utilize the predictive power of probability distributions to project process performance in advance.</li> <li>7. Graphically represent discrete and continuous random variables with probability distribution function according to their use in random processes.</li> <li>8. Integrate knowledge of normal, Binomial exponential, Poisson, and Weibull distribution in a coherent and meaningful manner to engineering processes.</li> <li>9. Demonstrate knowledge of the fundamental concepts of reliability and its formulae.</li> <li>10. Apply reliability concepts through Exponential and Weibull distributions for lifetime expectation of engineering products.</li> <li>11. Solve regression and correlation problems.</li> <li>12. Apply numerical analysis to the solution of linear equations, non-linear equations, and LAPLACE'S</li> </ol>

equation.

13. Utilize a statistical analysis software.