

SIE 305- Introduction to Engineering Probability and Statistics

Credits and Contact Hours:	3 Credits – Three 50-minute lectures per week
Instructor’s or course coordinator’s name:	Don Bruyere
Textbook, title, author and year:	Devore, Jay L. Introduction to Engineering Probability and Statistic, CENGAGE Learning. (University of Arizona Specific)
2021-2022 Catalog Description:	Axioms of probability, discrete and continuous distributions, sampling distributions. Engineering applications of statistical estimation, hypothesis testing, confidence intervals.
Prerequisites:	MATH 129 Each student must be able to: 1. Differentiate (derivatives of exp., log, and polynomial, etc.) 2. Integrate (single integrals, simple double integrals)
Required, Elective, or Selected Elective:	Required
Course Objectives:	<ul style="list-style-type: none">• Understand and apply basic probability correctly.• Understand when and how to use discrete and continuous probability models in univariate and multivariate contexts.• Application of probability to reliability.• Derive functions of random variables.• Learn the correct use point estimation techniques.• Develop confidence intervals, tolerance intervals, and prediction intervals.• Develop tests of hypotheses in single and two-sample scenarios. Collect and describe data.

**Student Outcomes –
Listed in Criterion 3 or
any other outcomes are
addressed by the course:**

Learning Outcome	Measure	Standard/Threshold
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions	Homework Assignment #8, 9, & 10 –Hypothesis test development and interpretation (Direct Measurement)	75% of the students must score 80% or higher

Topics covered:

- Combinatorics
- Basic Probability
- Discrete R.V.
- Continuous R.V.
- Descriptive Stats.
- Function of R.V.
- Joint R.V.
- Point Estimation
- Sampling Dist.
- Stat. Intervals
- Hypothesis Tests