COURSE NUMBER: Ve401	**COURSE TITLE:** Probabilistic Methods in Engineering
CREDIT: 4	**PREREQUISITES:** Vv256 or Vv286
TEXTBOOKS/REQUIRED MATERIAL: "Introduction to Probability and Statistics", J. S. Milton and J. C. Arnold,	**PREPARED BY:** Horst Hohberger **DATE OF PREPARATION:** October 7th, 2012 **DATE OF UC APPROVAL:** Oct. 30, 2013
INSTRUCTOR(S): Horst Hohberger	**SCIENCE/DESIGN:** n/a
CATALOG DESCRIPTION: Combinatorics and counting, basic concepts in probability, discrete and continuous probability distributions, joint distributions, descriptive statistics, estimation, hypothesis testing, non-parametric methods, analysis of categorical data, simple and multiple regression analysis, model selection, introduction to analysis of variance and experimental design.	**COURSE TOPICS:** 1. Basic concepts of probability theory (14 hrs at 45 min each) 2. Introduction to statistics (16 hrs) 3. Categorical data, linear and multi-linear regression analysis, analysis of variance (18 hrs)
COURSE STRUCTURE/SCHEDULE: Lecture: twice per week, 90 minutes each	

COURSE OBJECTIVES [Course Outcomes in brackets]	1. To provide basic knowledge of mathematics and its application to engineering problems. [1] 2. To provide knowledge of computer algebra systems (e.g., Mathematica) and their use in modeling engineering problems and solving complex mathematical questions. [4] 3. To provide experience in team work (division of labor and allocation of tasks among team members, integration of diverse contributions into a unified whole). [2,3] 4. To provide experience in creating written technical reports. [2,3]
COURSE OUTCOMES [Program Outcomes in brackets]	After completing Ve401, students should be able to: 1. Use mathematical techniques to solve problems in engineering. [a, e] 2. Work as a team to solve a given problem. [e, f, g] 3. Write a technical report on an engineering-related subject. [f] 4. Use the Mathematica software to solve mathematical and engineering problems.
ASSESSMENT TOOLS [Course Outcomes in brackets]	Homework [1,4] Three Exams [1] Written reports [1, 2, 3, 4]