

# UNIVERSITY OF MARYLAND

Department of Civil and Environmental Engineering  
College Park Campus

ENCE 615 - Structural Reliability

## INSTRUCTOR

Professor Bilal M. Ayyub

Office Hours TBA and by appointment

Office 0305, Engineering Classroom Bldg.

Telephone 301-405-1956 Office

Email [ba@umd.edu](mailto:ba@umd.edu)

URL <http://ctsm.umd.edu/ayyub>

## TEXTBOOKS

1. Ayyub and McCuen, *Probability, Statistics, and Reliability for Engineers*, CRC Press, FL, 1997, ISBN 0-8493-2690-7.
2. Ang and Tang, *Probability Concepts in Engineering Planning and Design*, Volumes I and II, John Wiley & Sons, 1975 and 1985, ISBN's 0-471-03200-X (v1) and 0-471-03201-8 (v2).

## REFERENCES

1. Melchers, R. E., 1987, *Structural Reliability Analysis and Prediction*, Ellis Horwood, UK.
2. Thoft-Christensen and Baker, *Structural Reliability Theory and Its Applications*, Springer-Verlag, 1982
3. Gary C. Hart, *Uncertainty Analysis, Loads, and Safety In Structural Engineering*, Prentice Hall, N.Y., 1982.
4. Ayyub, B. M., *Elicitation of Expert Opinions for Uncertainty and Risks*, CRC Press, 2001.

## GRADING

Homework (25%), Project (25%), and Two Exams (50%)

## COURSE OUTLINE

Review of Fundamentals of Probability and Statistics

Simulation Methods

Reliability of Structural Components

Probabilistic Design Format

Reliability of Structural Systems

Risk Analysis

Structural Loads

Stochastic Processes and Load Combination

Uncertainty Types and Measures

## **HOMEWORK ASSIGNMENTS**

Professional presentation of homework assignments is required. Professional presentation consists of neat and organized solution of problems on one side of 8.5"x11" papers. The homework assignments are due one week after they are assigned.

## **PROJECT**

Individuals or teams of two are required to work on a research study on a selected topic in probabilistic analysis or reliability, perform needed tasks, and submit the following as applicable:

Title Page

Executive Summary

Table of Contents

Objectives and scope

Historical development

Methodology summary

Applications

Conclusions

References and Appendices

Professional presentation of the project report is required that should consist of neat and organized solutions on one side of 8.5"x11" papers. Computer-generated plots and printouts are required for all sample, and summary calculations. Also, teams are required to setup a web page with all project details and report, and related links. The project is due on the last day of classes.