淡江大學 97 學年度第 一 學期課程教學計畫表

壹、科目名稱：可靠度分析

貳、授課老師：廖國偉

參、開課系所班級：土木系碩士班一

肆、必選修：必

伍、學分數：3

陸、先修科目：無

柒、教學內容及進度：

Variability and uncertainty exist in engineering design parameters is a common phenomenon. How to consider variability/uncertainty in engineering problems is the focus of this course. This course will first review the fundamental concept of probability theory including many usual and useful probability distributions. Then, the difference between deterministic analysis and reliability analysis will be introduced. Two major reliability analysis approaches, the sampling method and approximated method are discussed and applied to the real engineering problem. Sampling method such as Monte-Carlo Simulation or Importance Sampling is a time-consuming technique, but usually provides analyst a more reliable result. Approximated methods such as FORM, SORM or RSM method, on the other hand, provides a more efficient way to perform the reliability analysis. However, the accuracy needs to be ensured, especially, for a complicated and highly non-linear problem. Inverse reliability analysis (PMA) has been attracted many researchers recently. PMA has also been applied in many fields such as reliability-based design optimization (RBDO). Response Surface method (RSM) and Design of Experiment (DOE) are two major techniques for RBDO in industry and they will be introduced with the RBDO and PMA. In addition, system reliability is also introduced in this class. Bayesian theory and other recent applications of reliability analysis in civil engineering will be discussed in this class depending on the time frame.

捌、授課方式：口述、投影片

玖、教學設備：電腦

拾、無(講義)

拾壹、參考課本：Probability Concepts in Engineering Planning and Design, Volume I & II

Authors: Alfredo H-S. Ang
Wilson H.Tang

Publisher: John Wiley & Sons

ISBN: 0-471-03200-X (Volume I)

拾貳、成績考核方式：

平時成績： 20 %
期中考成績： 40 %
期末考成績： 40 %
讀書報告： %
其他（ ）： %