1. 課程名稱：微電腦橋樑結構分析
2. 學分數：3
3. 課程編號：N656100
4. 授課教師：朱聖浩
5. 課程目標：熟悉高樓結構分析及設計。
6. 課程內容概要：
   In this course, students will learn the three-dimensional structural analysis of bridges using microcomputers. The contents of this course are listed below:
   1. Review of the matrix method for structural analyses. (2 weeks)
      The matrix method for structural analyses will be reviewed at the beginning of the course. The contents include (1) Stiffness matrices of truss and beam elements, (2) Evaluation of member properties, (3) Calculation of fixed-end-moments, (4) Static analysis, (5) Calculation of member forces, and (6) loading conditions.
   2. Structural analyses using Micro-SAP (3 weeks)
      The structural analysis program, Micro-SAP, will be supplied to teach students how to perform two-dimensional and three-dimensional structural analyses using truss and beam elements.
   3. Evaluation of the influence line using Micro-SAP (2 weeks)
      One of the most important topics of bridge analyses is to evaluate the influence line for a bridge. In this section, students will learn how to evaluate the influence line of a structure using Micro-SAP. The influence line program, INFL, of Micro-SAP includes the computer graphic system. The comparison of the influence line plot between the Micro-SAP and theoretical analyses will be performed by students.
   4. Flexible-floor assumption of bridge analyses (1 week)
      The assumption of the bridge flexible floor systems, will be discussed. The three-dimensional plane-stress elements will be used to model the floor system of the bridge. Student will learn the difference between with and without these plane-stress elements.
   5. Loading conditions of the bridge analysis (1 week)
      The loading conditions of the bridge analysis including dead load, live load, wind load, earthquake and thermal load will be taught in this section. Except the live load, students will learn how to analyze a bridge under these loads using Micro-SAP.
   6. Live load of the bridge analysis (4 weeks)
      The live load including truck and lane loads of the bridge analysis is the most complex part of the bridge analysis. Students will learn the rules of this live load; furthermore, they will use Micro-SAP to generate the live load of each member in a bridge.
   7. Loading combination (1 week)
   8. Pre- and post-processors for bridge analysis (2 weeks)
   9. An example of bridge analysis (1 weeks)
7. 成績計算方式：
   (1) Homework 50%, (2) Final project 20%, and (3) Final examination 30%.
8. 教科書或主要參考書：
   Class notes will be supplied in this course.
9. 適合選修對象：碩博士研究生
10.建議先修基礎課程：結構矩陣法