1. 課程名稱：地下空間開發
2. 學分數：3
3. 課程編號：N672300, 952
4. 授課教師：吳建宏
5. 課程目標：This course will help students to understand the current status of underground space development.
6. 課程內容概要：
   This course includes five sections, such as introduction, outline of Taiwan geology, investigation and tests in the rock mass, excavation methods, and underground space developments are shown as follows:
1. INTRODUCTION: The overcrowded population in the big cities and the requirements of national defense, energy storage and the storage of noxious wastes are the primary reason to search for a large space, which is hardly affected from the ground surface. Thus, underground space development can be a way to solve these problems, but the optimum usage of underground space remains a tough question.
2. GEOLOGIC OUTLINE OF TAIWAN: Taiwan is located at the boundary of Euroasian and Philippine plates. The complicated geologic conditions and young rock mass, generated in the Tertiary and Quaternary, are the primary geologic features on the island.
3. ROCK MASS INVESTIGATION AND TESTS: In-situ stress measurements, hydrologic geology tests, discontinuity analysis and rock mass classification are the primary sub-sections and are described as follows:
   (1) In-situ stress measurement: The in-situ stress measurement methods, such as hydraulic fracturing, over-coring, plate jack etc, will be introduced.
   (2) Hydraulic geology investigations: Introducing the Lugeon Test, pulse test to determine the in-situ hydraulic parameters.
   (3) Discontinuity analysis: Stereo-net, Key Block Theory and other related analysis methods to investigate the discontinuities.
   (4) Rock mass classification: RQD, RMR, Q etc.
4. UNDERGROUND EXCAVATION: Introducing the NATM and TBM excavation methods.
5. UNDERGROUND SPACE DEVELOPMENT: Introducing the cases of underground space developments:
   (1) Underground Rock Laboratory
   (2) Japanese HLW Disposal
   (3) CO2 underground storage
7. 成績計算方式：
   (a) Midterm................................................................................35%
   (b) Presentation..........................................................................35%
   (c) Report...................................................................................30%
8. 教科書或主要參考書：
   2. JNC, (1999), H12 : Project to Establish the Scientific and Technical Basis for HLW Disposal in Japan, Japan.
9. 適合選修對象：博碩研究生選修
10. 建議先修基礎課程：無