**Summer 2018 Study Abroad**

# Environmental Management and Sustainable Development in Taiwan

## 2018 暑期台灣移地教學: 環境管理與永續發展

**帶隊教授: 邱逸文博士 (自然資源管理暨環境科學系)**

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**1. 場地提供: 台北(國立台北科技大學)，南投(國立暨南大學)**

**2. 時間: 2018 年七月一日至八月十一日，共六星期**

**3. 學分數: 八學分**

- GE C4 & USCP: NR360 **Ethnicity and the Land** (4 units) 族群與土地(四學分)
- GE D5: NR 323 **Human Dimensions in Natural Resources Management** (4 units) 人文與自然資源管理 (四學分)

**4. 計畫簡介:** 本移地教學計劃(簡稱本計畫)由邱逸文博士策畫與執行，並擔任在台灣的授課負責人。預計在台北停留時間二星期，之後前往南投停留四星期。本校 (Cal Poly, or CP) 學生將有機會利用不同的自然環境與學習資源，從社會、人文、經濟、政策與歷史等面向，探討當代環境及永續議題。尤其有感於網路世界中，對台灣的英文介紹仍不盡完善亦不夠全面，而且對台灣珍貴的的環境與生態資源少有著墨，邱博士企圖藉有本學程，針對台灣所面臨的環境挑戰、永續的成果等，由美國學生直接參與，建立長期的系統化資料蒐集與報導，讓世界各地的民眾能有機會對台灣做更詳細的認識。停留台北期間，將由台北科技大學支援並提供室內教學場地，在南投期間，則由暨南大學提供協助。期間將穿插戶外教學活動，以利直接觀察台灣的社會與環境特色，並藉此輔助室內課程所涵蓋的相關議題。本計畫並將從北科大以及暨大甄選具雙語能力的台灣學生各四名，擔任美國學生在台期間的學習與生活輔導員 (Peer Advisor or PA)。台灣 PA 除提供美國學生生活上的協助之外，也將直接參與本計畫所有的教學課程，共同學習與討論，以達到國際深度交流與同儕互助學習的目標 (詳見下頁第 7 小節)。同儕互助學習的教學方法是本計畫執行上另一個重點，藉此讓雙邊學生能多方面了解東西方對永續發展的異同。全程教學將用系統思維 (systems thinking) 為基礎，串聯室內講課(基本觀念建構)、團體活動與討論 (小組研究工作)，以及戶外參訪(觀察與資料蒐集)。學生將利用系統思維，表達環境系統中各種因子的交互關係及反饋，以期能清楚表達環境問題的本質，並有效的腦力激盪可行的策略。學程最後一天，將舉行期末考、團隊簡報，並提交小組書面報告，以作為學生學習成績評量的依據。由於本校參與學生沒有中文能力要求，因此**全程將用英文授課**。戶外參訪行程的交通食宿安排，將由本校在台簽約廠商，依據本

計畫的課程與行程需要，逐一規劃並負責預約。台北活動期間的學生住宿，亦由此簽約廠商負責與北科大校園附近的旅社接洽。在南投期間，學生則入住暨大會館。 周末為學生自由活動時間，將請台灣 PA 提供觀光行程建議並盡量陪同，讓美國學生有機會暢遊台灣各地，並深度感受多元風土民情。

**5. 戶外參訪行程:** 本學程戶外參訪行程旨在善用台灣豐富的自然環境與人文資源，做為探討永續發展的天然大教室。主要參訪地點如下，

1) Feitsui Reservoir (day trip): 翡翠水庫，當天來回
2) Yangmingshan National Park (day trip): 陽明山國家公園，當天來回
3) Guandu Nature Park (day trip): 關渡保護區，當天來回
4) Industrial Technology Research Institute, ITRI (day trip): 工研院 (移師南投的途中)
5) Dasyueshan Forest Recreation Area (three-day overnight trip): 大雪山國家森林，三天兩夜
6) Sun Moon Lake (day trip): 日月潭，當天來回
7) Xitou Nature Education Forest (two-day overnight trip): 溪頭，兩天一夜

**6. 領隊教授簡介:** 邱逸文博士自 2014 年起，至 Cal Poly 任教，現擔任永續科學及應用之量化研究與教學負責人，致力於永續科學、環境生命週期，以及地理資訊系統的研究與教育推廣，提供學生參與研究計畫之機會以驗證並應用課堂所學，落實本校從做中學 (Learn by Doing) 的教育理念。邱博士於台灣大學取得森林學士學位後，赴美國南卡羅萊納大學 (Univ. of South Caroline) 取得環境與地球科學碩士，後至明尼蘇達大學 (Univ. of Minnesota) 攻讀水資源科學碩士及博士學位。在前往明尼蘇達大學就讀之前曾返回台灣，於台北科技大學水環境研究中心擔任執行祕書及助理研究員，投入生態工法與集水區管理的研究與推廣。在明尼蘇達取得博士學位後，即至位於芝加哥的美國阿爾崗國家研究室 (Argonne National Laboratory)，進行為期三年之博士後研究，參與美國能源署再生能源水足跡之模式建構並探討能源政策與環境衝擊的關聯性。自學生時代以來，由於學習興趣與研究需求，邱博士亦曾旅居英國以及瑞士。加上研討會演講的需要，足跡遍及美國境內各州，並曾前往加拿大、葡萄牙等國。這些經歷不但讓邱博士得以結識世界各地學者專家，並深刻體會國際化的多元文化洗禮對於開拓學生視野、訓練獨立處事及思考能力的重要性。因此至 Cal Poly 任教之後，便開始著手籌措本計畫，並於各方的支持與協助之下，得以在 2018 順利推動。此不但將是 Cal Poly 多達四十個國際交換學生與移地教學計畫中，第一個前往台灣的企劃，也是第一個著重環境永續議題的課程。邱博士將帶領學生，一同體驗台灣的風土人文，並探討其在環境保育的瓶頸、社會觀念的轉型、民眾參與的成就，以及展望未來的企圖心。

**7. 台灣學生輔導員(Peer Advisor, PA)主要工作:** 協助辦理新生訓練相關活動、參與 CP 課程與美籍學生一起互動並供語言協助(例如中文資料的重點英譯)、協助日常生活與飲食建議，以及提供並陪同(長途隔夜行程除外)周末旅遊參觀資訊與建議。美國學生戶外參訪日則為 PA 休息日，以確保台灣學生獲得適當的舒緩與休息。

# 行程規劃初步構想 (六星期，共計 8 學分)

- 第一、二星期　　台北地區場地提供單位: 台北科大　(住宿規畫: 校外旅舍)
- 第三至六星期　　南投地區場地提供單位: 暨南大學　(住宿規畫: 暨南會館)

| Date | Activity & Topics | Location |
|---|---|---|
| July 2 | **Cal Poly 學生抵達台北(契約廠商安排接機)，住宿 check-in** | 台北市區 |
| July 3 | 新生文化座談會 – 認識環境，介紹北科大學生輔導員 (PA)<br>***歡迎晚會 (師生聚餐，契約廠商安排)*** | 北科大 |
| July 4-6 | CP 課程 – 人口成長，土地利用規劃，都市擴張，熱島效應 | 北科大、台大校園*、市區* |
| July 7-8 | 周末自由活動 | |
| July 9 | 戶外教學 – 水資源及集水區管理，BMPs，土地利用之衝突 | 翡翠水庫 (自來水廠) |
| July 10 | 戶外教學 – 火山地形地質，生態保育及教育 | 陽明山國家公園 |
| July 11 | 戶外教學 – 紅樹林與海濱生態系，新型態環境友善農業 | 關渡公園 |
| July 12-13 | CP 課程 – 生產與消費(工業生態學)，環境生命週期影響評估 | 北科大 |
| July 14-15 | 周末自由活動 | |
| July 16-18 | **啟程前往南投**<br>戶外教學 – 氣候變遷及減緩策略<br>戶外教學 – 氣候與生態系，公園步道規劃與環境教育<br>**抵達暨南大學，住宿 Check-in** | 工研院 (停靠新竹)<br>大雪山保護區 (三天兩夜)<br>暨南大學 |
| July 19 | 新生座談會 – 認識環境，介紹暨南大學學生輔導員 (PA)<br>學生團體報告小組討論時間 | 暨南大學 |
| July 20 | CP 課程 –生態工法，永續社區營造 | 暨南大學，埔里小鎮* |
| July 21-22 | 周末自由活動 | |
| July 23-27 | CP 課程 – 里山文化與生態，綠色永續農業，民眾參與 | 暨南大學，埔里小鎮* |
| July 28-29 | 周末自由活動 | |
| July 30 | 戶外教學 – 湖泊生態學，區域生態學，綠色觀光產業 | 日月潭 |
| July 31-Aug 1 | 戶外教學 – 鹿谷茶園(高經濟作物與環境保育)，森林資源與林業史，遊憩管理，環境監測 | 溪頭 (兩天一夜) |
| Aug 2-3 | CP 課程 – 區域發展與城鄉差距，世代交替 | 暨南大學，埔里小鎮* |
| Aug 4-5 | 周末自由活動 | |
| Aug 6-8 | CP 課程 – 土地倫理 | 暨南大學，埔里小鎮* |
| Aug 9 | 讀書日，小組工作時間 | 暨南大學 |
| Aug 10 | 期末考 (上午)，團隊報告與成果發表 (下午)<br>***惜別晚會 (師生聚餐，契約廠商安排)*** | 暨南大學 |
| Aug 11 | 結束台灣行程 | 桃園國際機場 |

*視天候而定

# Cal Poly Taiwan Program Syllabus

Successfully completing this program, students will earn 8 credit units from NR 323 (Humana Dimensions in Natural Resources Management) and NR 360 (Ethnicity and the Land), which can satisfy GE credits in the areas of D5 and C4, respectively. As NR 323 and 306 are highly relevant, these two courses will be taught concurrently during students' stay in Taiwan in order to optimize the educational resources provided by each field trip and all in-class activities. When in-class lectures take place, students should expect to conduct group discussion periodically. All the group discussion will apply the principle of systems thinking and causal loops to bridge various driving factors and feedback loops that can aid the understanding on environmental issues we observe during our stay in Taiwan. Students will have the opportunity to interact with local students and communities featuring sustainable development and practices in order to explore Taiwan in depth and to ensure a diverse and profound learning experience.

## COURSE FORMAT

In-class lectures, guest lectures, field trips and survey, and group discussion (with local communities and Taiwanese students).

## GRADING

**Participation (30%)** is to encourage students to contribute and participate in class discussion or any relevant in-class activities. This also provides a training to facilitate the analysis of facts and scientific reasoning.

**Final Exam (20%)** is conducted to evaluate students' understanding and competence to articulate environmental sustainability from a systematic perspective.

**Group project (50%)** will facilitate student engagement in scientific documentary by working as a team. Each group will carry out a project aiming to document a selected environmental challenge which is elaborated from the aspects of culture and socio-economic by incorporating systems thinking. The final deliverables of each course are slightly different: NR 323 requires a written report, whereas NR 360 consists of an oral presentation and a multi-media product. All scores associated with group activities will be adjusted by individual contribution (evaluated by each member at the end of this program). Thus, total grades your group received will be individualized and adjusted based on your contribution evaluated by your group member.

## CLASS ETIQUETTE & POLICIES

- Please keep the contact information of the instructor and at least one peer student in case of emergency. Students must notify the instructor about your weekend travel plan(s) in advance if any.
- Students are held accountable for participation and attendance at all time during weekdays. Unless health condition is noted, students must prepare to attend all field trips and follow all safety guidance at all time.
- If you have any documented disability that might affect your learning and performance in class, please contact the instructor as soon as possible to discuss alternative solutions or academic accommodations.
- In many occasions, students will interact with local communities and Taiwanese students with diverse background, educational status, and religious/political opinions. Please be respectful and open-minded while engaging in any discussion. Any forms of violent behavior physically or verbally are prohibited.

# NR 323 Human Dimensions in Natural Resources Management

## COURSE DESCRIPTION

The primary objective of this course is to help students understand the big picture of how anthropogenic activities can affect the sustainability of natural resources. The course is divided into different topic categories addressing the political, socio-economic, and management issues. All field trips and lectures are designed to facilitate the learning opportunities to understand the interaction between natural resources sustainability, anthropogenic consumption, and social development. Moreover, students will have the opportunities to visit and interact with local communities to directly discuss the social challenges associated with natural resources management. As part of the course effort together with NR 360, students are requested to conduct group projects by selecting a natural resource interesting them. Each group will develop an introductory report to document their observation, and give a presentation sharing their findings at the end of the program.

## COURSE OUTCOME

- Develop the capabilities to understand and analyze the effects of anthropogenic consumption on natural resources from a holistic perspective.
- Become familiar with the key socioeconomic factors which can drive the fate of natural resources.
- Expose to the systematic thinking for analyzing modern environmental issues.
- Develop the competence to abstract complex sustainability challenges by incorporating causal diagrams and feedback loops.

## COURSE ACTIVITIES

| Topics | Corresponding Field Trips |
|---|---|
| Estuary ecosystems | Guandu Nature Park |
| Forest resources | Dasyueshan Forest Recreation Area<br>Xitou Nature Education Forest |
| Endangered species protection | Yangmingshan National Park |
| Land and water resources<br>Watershed management | Yangmingshan National Park<br>Feitsui Reservoir<br>Municipal Wastewater Plants |
| Air resources and policies | Dasyueshan Forest Recreation Area<br>Industrial Technology Research Institute |
| Eco-friendly agriculture | Sun Moon Lake<br>Xitou Nature Education Forest |
| Ecological engineering | Feitsui Reservoir |
| Sustainable community and public engagement | Feitsui Reservoir<br>Sun Moon Lake |
| Socioeconomic drivers in sustainable development | Sun Moon Lake |
| Public education | Yangmingshan National Park<br>Guandu Nature Park<br>Dasyueshan Forest Recreation Area |

## GROUP PROJECT

To earn the credit units of this course, students must complete a written report to address a selected environmental issues related to natural resources management and sustainability. Specific components must be incorporated in the writing, including: a causal diagram, and suggestions to improve the condition of the studied target or alternative solutions to sustain the studied target.

# NR 360 Ethnicity and the Land

## COURSE DESCRIPTION

This course aims to facilitate the learning and discussion on land use challenges by integrating the aspects of ethnicity, culture, and historical transition. Students understand the big picture of how anthropogenic activities can affect the sustainability of natural resources. The course is divided into different topic categories addressing the political, socio-economic, and management issues. The course will take place in two distinctive locations (populated international city and rural town with tribal culture) which provide a unique setting to ensure a rich learning experience to explore social transition, cultural diversity, and how these have become a driving force to shape a country's land use pattern and development. Students will enjoy the scenic landscape of Taiwan and learn the complex connection between land, society, history, and culture. Aligning with NR 323, students are requested to conduct group projects by selecting a studied area interesting them. Each group will develop an introductory material to document their observation, and give a presentation sharing their findings at the end of the program. The material can be a footage of a video produced by student group, digital map, or any sort of media of a group's choice.

## COURSE OUTCOME

- Understand the contemporary land use challenges and causes.
- Develop the capabilities to bridge ethnic, social, and cultural aspects to aid land planning and management.
- Become familiar with the key socioeconomic factors which can drive the change of land cover and land use patterns.
- Expose to modern techniques for land management by incorporating social factors.

## COURSE ACTIVITIES

| Topics | Corresponding Field Trips |
|---|---|
| Ethnic composition in Taiwan | Sun Moon Lake |
| Transition of land ownership: historical perspective | Yangmingshan National Park<br>Xitou Nature Education Forest |
| Urban sprawling | Yangmingshan National Park<br>Feitsui Reservoir |
| Social and ethnic drivers in land conservation | Sun Moon Lake<br>Dasyueshan Forest Recreation Area |
| Community revival and land ethic | Sun Moon Lake<br>Xitou Nature Education Forest |
| "Satoyama" – landscape, community, agriculture, and generational evolution | Sun Moon Lake<br>Xitou Nature Education Forest |
| Immigrants: social challenges and agriculture | Feitsui Reservoir<br>Sun Moon Lake |
| Change of perception: cross-generational land ethic | Guandu Nature Park<br>Sun Moon Lake |

## GROUP PROJECT

Students will deliver an oral presentation articulate their observation on a selected topic related to land use from the aspect of ethnicity and social evolution. Accompanied by the presentation, students much incorporate a media of their choice to highlight their core value (resembling why, past, introduction), study theme (resembling what, now, method), and key message (resembling vision, future, result). Ideal media includes, but not limited to, film, interactive map (ESRI Story Map), or webpages.