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課 綱 Course Outline (碩士班)

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| 中文課程名稱  Course Name in Chinese | 全球衛星定位系統與地表作用專題 | | | | | |
| 英文課程名稱  Course Name in English | Special Topics of GPS and earth surface processes | | | | | |
| 科目代碼  Course Code |  | 班 別  Degree | □學士班Bachelor’s □碩專班 Master’s program  ■碩士班Master’s □博士班 Ph.D. | | | |
| 修別  Type | □必修Required  ■選修Elective  □學程Program | | 學分數  Credit(s) | 3 | 時 數  Hour(s) | 3 |
| 先修課程  Prerequisites | 無 | | | | | |

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| 課程目標  Course Objectives | 建立碩士班學生之地球科學背景知識與測量技術  To establish the background knowledge of the interactions between earth environment and physical, chemical and biological processes for MSc students and surveying techniques | | |
| 系教育目標  Dept.’s Educational Objectives | 培養兼具國際視野與本土關懷的學生  To develop students who care about local issues and have an international perspective | 培養具備自然科學與社會科學知識的人才  To educate students to have knowledge of both the natural and social sciences | 培養具備環境倫理與人文素養的環境公民  To teach students to be environmental citizens (i.e., knowledgeable about environmental ethics and human issues) |
| 課程目標與系教育目標相關性  Correlations between Course Objectives and Dept.’s Educational Objectives | ● | ● | ◎ |
| 圖示說明Definitions ：● 高度相關 Highly correlated ◎中度相關 Moderately correlated | | | |

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| 系專業(基本）能力  Basic Learning Outcomes | A.能覺知多元的自然科學與社會科學理論並具備研究能力  To have knowledge of natural and social science theories  B.具備自然資源與人類社會議題之調查分析、規劃與經營之能力  To be able to investigate, analyze, plan, and manage both natural resource and human social issues  C.具備將環境倫理與生態思想落實於永續性生活型態的能力  To implement sustainable lifestyles based on environmental ethics and ecological principles  D.能以整全式的觀點來解析環境問題，並具備發展系統性解決方案的能力  To resolve environmental issues and develop systematic solutions with a global perspective  E.具備系統分析、未來思考、溝通協調與團隊合作的能力  The ability to analyze, plan, communicate, and coordinate with others (teamwork)  F.具備終身學習、國際視野與外語溝通的能力  To instill the values of lifelong learning, an international perspective, and the ability to communicate in a foreign language | | | | | |
| 課程目標與系專業能力相關性  Correlations between Course Objectives and Basic Learning Outcomes | A | B | C | D | E | F |
| ● | ● | ◎ | ● | ● | ● |
| 圖示說明Definitions ：● 高度相關 Highly correlated ◎中度相關 Moderately correlated | | | | | | |

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| 課程大綱(Course Outline)  This course covers the following topics(課程包含以下單元與軟體操作):   1. **The GPS Signal:** Signal Structure, Two Observables, Pseudoranging and Carrier Phase Ranging 2. **Biases and Solutions:** The Error Budget, Differencing 3. **The Framework:** GPS Segment Organization, GPS Constellation, The Control Segment 4. **Receivers and Methods,** Common Features of GPS Receivers, Choosing a GPS Receiver, Surveying Methods 5. **Coordinates,** Geodetic Datums for GPS, State Plane Coordinates, Heights 6. **GPS Surveying Techniques,** Static GPS Surveying, RTK and Differential GPS (RTK-GPS and DGPS) 7. **Observing and Processing,** Static GPS, RTK and DGPS Observations Processing 8. **GPS Modernization and Global Navigation Satellite System (GNSS),** GPS Modernization, L5, Global Navigation Satellite System (GNSS), GLONASS, BEIDOU/COMPASS, The Future, Interoperability 9. **Introduction to Gamit/Globk, GGMatlab and track software and their application** |
| 資源需求評估（師資專長之聘任、儀器設備的配合．．．等）  Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)  PC for GPS data processing |
| 課程要求和教學方式之建議  Course Requirements and Suggested Teaching Methods  課堂講授  Lectures and Lab exercises |
| 課程成績評定之依據和標準  Grading Criteria  期中與期末考  There are three Lab exercises for processing static GPS data and real-time GPS data and three assignments after the Lab exercise course.  Textbook: GPS for Land Surveyors, Third Edition,Published:May 5, 2008 by CRC Press, 360 Pages. Author(s): Jan Van Sickle  Gamit/Globk, GGMatlab and track software can be downloaded from http://www-gpsg.mit.edu/~simon/gtgk/ |
| 其他  Miscellaneous |