

# Department of Earth Sciences Courses List(2012-2021) – Master Program

Note :

1. The number with the break ( ) indicates the credits.
2. Color Code: **Eligible Course**, Astronomy, Atmospheric Science, Geology, Geophysics, Ocean, Sci. Edu., Integrated Course.
3. Course with “\*” are Undergraduate-Master Joint Courses; course with “#” are Master-Doctoral Joint Courses; courses in bold and italic are taught in English in the corresponding semester.

| 101-1<br>(2012 Fall)        | Required                         | Selected                                                                                                                                                                                             |
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| <b>ASTRONOMY</b>            | Seminar(I)(1)<br>Seminar(III)(1) | Advanced Astronomical Observations(3)#<br>Advanced Astrophysics(3)#<br>Interstellar Medium(3)#<br><i>Tools for Modern Astronomy(3)#</i>                                                              |
| <b>ATMOSPHERIC SCIENCES</b> |                                  | Climatology(3)*<br>Synoptic Meteorology(3)*<br>Boundary Layer Meteorology(3)<br>Research Methodologies in Atmospheric Sciences(3)#                                                                   |
| <b>GEOLOGY</b>              |                                  | Geodynamics(3) *<br>Mineralogy(including Lab.)(3)*<br><i>Planetary Geology(3) *</i><br>Advanced Petroleum Geology(3)#<br>Core-Log Integration(3)#<br>Earth Sciences and Archaeology(3)#              |
| <b>GEOPHYSICS</b>           |                                  | Earth Science Data Processing(3) *<br>Gravity and Geomagnetism(2)#<br>Gravity and Geomagnetism Laboratory(1)#<br>Inverse Theory(3)#<br>The Dynamics of Fault Zone(3)#                                |
| <b>OCEANOGRAPHY</b>         |                                  | Introduction to Marine Chemistry(3) *<br>Physical Oceanography(3) *                                                                                                                                  |
| <b>EDUCATION</b>            |                                  | Curriculum Design in Earth Sciences(3) *                                                                                                                                                             |
| 101-2<br>(2013 Spring)      | Required                         | Selected                                                                                                                                                                                             |
| <b>ASTRONOMY</b>            | Seminar(II)(1)<br>Seminar(IV)(1) | Active Galaxies(3)*<br>Radio Astronomy(3) *<br><i>High Energy Astrophysics(3)#</i><br><i>Introduction to Modern Cosmology(3)#</i>                                                                    |
| <b>ATMOSPHERIC SCIENCES</b> |                                  | Meteorological Statistics(3)*<br>Advanced Synoptic Meteorology(3)#<br>Topics in Monsoon Dynamics(3)#                                                                                                 |
| <b>GEOLOGY</b>              |                                  | Advanced Field Geological Techniques(3) *<br>Field Geology(including Lab.)(3) *<br><i>Geochemistry(3) *</i><br>Petrology(including Lab.)(3) *<br>Stable Isotope Geology(3) *<br>Regional Geology(3)# |

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| <b>GEOPHYSICS</b>              |                                  | Earthquakes of the Week(3) *<br>Geophysical Methods(3) *<br>Paleomagnetism(3) *<br>Seismic Stratigraphy(2)#<br>Seismic Stratigraphy Laboratory(1)#                                                                                                          |
| <b>OCEANOGRAPHY</b>            |                                  | Satellite Remote Data Analysis (I) (3)#<br>Applied Numerical Methods in Oceanography (3)#                                                                                                                                                                   |
| <b>102-1<br/>(2013 Fall)</b>   | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                                             |
| <b>ASTRONOMY</b>               | Seminar(I)(1)<br>Seminar(III)(1) | Advanced Astrophysics(3)#<br>Advanced Astronomical Observations(3)#<br>Interstellar Medium(3)#<br><i>Tools for Modern Astronomy(3)#</i>                                                                                                                     |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Climatology(3)*<br>Synoptic Meteorology(3)*<br>Meso-scale Meteorology#<br>Advanced Dynamic Meteorology(3)#<br>Research Methodologies in Atmospheric Sciences(3)#<br>Topics in Numerical Weather Prediction(3)#                                              |
| <b>GEOLOGY</b>                 |                                  | Mineralogy(including Lab.)(3)*<br>Structural Geology(including Lab.)(3)*<br><i>Continent and Supercontinent Evolution(3)*</i><br><i>Geo-technical Writing(3)#</i><br><i>Micro-Structural Geology(3)#</i><br>Advanced Geothermics(3)#                        |
| <b>GEOPHYSICS</b>              |                                  | <i>Earth Science Data Processing(3)*</i><br>Engineering Geophysics(3)#                                                                                                                                                                                      |
| <b>OCEANOGRAPHY</b>            |                                  | Ocean Circulation(3)*<br>Numerical Ocean Circulation Modeling (3)#                                                                                                                                                                                          |
| <b>102-2<br/>(2014 Spring)</b> | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                                             |
| <b>ASTRONOMY</b>               | Seminar(II)(1)                   | NA                                                                                                                                                                                                                                                          |
| <b>ATMOSPHERIC SCIENCES</b>    | Seminar(IV)(1)                   | Meteorological Statistics(3)*<br>Tropical Meteorology(3)*<br>Boundary Layer Meteorology(3)                                                                                                                                                                  |
| <b>GEOLOGY</b>                 |                                  | Field Geology(including Lab.)(3)*<br><i>Geochemistry(3)*</i><br>Geological Survey(3)*<br>Petrology(including Lab.)(3)*<br>Sedimentology and Stratigraphy(3)*<br>Petrographic Methods(3)#<br>Strain Analysis(3)#<br><i>Stress Regimes in Lithosphere(3)#</i> |
| <b>GEOPHYSICS</b>              |                                  | Earthquakes of the Week(3)*<br>Paleomagnetism(3)*<br>Seismotectonics(3)*<br>Inverse Theory(3)#                                                                                                                                                              |
| <b>OCEANOGRAPHY</b>            |                                  | Innovation Trends in Oceanography(3)*                                                                                                                                                                                                                       |

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| <b>HY</b>                       |                                  | Satellite Remote Data Analysis (I)(3)#<br>Climatic and Oceanic Variability(3)#                                                                                                                                           |
| <b>EDUCATION</b>                |                                  | Historical Perspectives on Science Development(3)*                                                                                                                                                                       |
| <b>103-1<br/>(2014 Fall)</b>    | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                          |
| <b>ASTRONOMY</b>                | Seminar(I)(1)<br>Seminar(III)(1) | Open Cluster(3)<br>Advanced Astrophysics(3)#<br>Advanced Astronomical Observations(3)#<br><i>Interstellar Medium(3)#</i>                                                                                                 |
| <b>ATMOSPHERIC<br/>SCIENCES</b> |                                  | Climatology(3)*<br>Numerical Weather Prediction(3)*<br>Synoptic Meteorology(3)*<br>Climate Change(3)#<br>Research Methodologies in Atmospheric Sciences(3)#                                                              |
| <b>GEOLOGY</b>                  |                                  | Geodynamics(3)*<br><i>Planetary Geology(3)*</i><br>Stable Isotope Geology(3)*<br>Structural Geology(including Lab.)(3)*<br>Advanced Marine Geology(3)#<br>Core-Log Integration(3)#<br>Earth Sciences and Archaeology(3)# |
| <b>GEOPHYSICS</b>               |                                  | Sesimomagnetism(II)(3)#                                                                                                                                                                                                  |
| <b>OCEANOGRAPHY</b>             |                                  | Introduction to Marine Chemistry(3)*<br>Introduction to Marine Physics(3)*<br>Applied Numerical Methods in Oceanography (3)#                                                                                             |
| <b>103-2<br/>(2015 Spring)</b>  | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                          |
| <b>ASTRONOMY</b>                | Seminar(II)(1)<br>Seminar(IV)(1) | Active Galaxies(3)*<br>Radio Astronomy(3)*<br><i>High Energy Astrophysics(3)#</i>                                                                                                                                        |
| <b>ATMOSPHERIC<br/>SCIENCES</b> |                                  | Atmospheric Dynamics(II)(3)*<br>Meteorological Statistics(3)*<br>Tropical Meteorology(3)*<br>Advanced Synoptic Meteorology(3)#<br>Topics in Meteorological Phenomena in Eastern Asia(3)#                                 |
| <b>GEOLOGY</b>                  |                                  | Advanced Field Geological Techniques(3)*<br>Paleomagnetism(3)*<br>Petrology(including Lab.)(3)*<br>Petrographic Methods(3)#<br>Regional Geology(3)#<br>Stress Regimes in Lithosphere(3)#                                 |
| <b>GEOPHYSICS</b>               |                                  | Advanced Geophysics (3)#<br>Theoretical Geophysics (3)#                                                                                                                                                                  |
| <b>OCEANOGRAPHY</b>             |                                  | Satellite Remote Data Analysis (I) (3)#                                                                                                                                                                                  |
| <b>EDUCATION</b>                |                                  | Historical Perspectives on Science Development(3)*<br>Cognition and Instruction(3)#                                                                                                                                      |
| <b>104-1</b>                    | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                          |

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| <b>(2015 Fall)</b>             |                                  |                                                                                                                                                                                                                                                                 |
| <b>ASTRONOMY</b>               | Seminar(I)(1)<br>Seminar(III)(1) | The structure and Kinematics of the Galaxy(3)<br>Advanced Astrophysics(3)#<br>Advanced Astronomical Observations(3)#<br><i>Interstellar Medium(3)#</i>                                                                                                          |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Climatology(3)*<br>Synoptic Meteorology(3)*<br>Meso-scale Meteorology(3)#<br>Research Methodologies in Atmospheric Sciences(3)#<br>Statistical Analysis in Climate Research(3)#<br>Topics in Monsoon Dynamics(3)#<br>Topics in Numerical Weather Prediction(3)# |
| <b>GEOLOGY</b>                 |                                  | <i>Geochemistry(3)*</i><br><i>Stable Isotope Geology(3)*</i><br>Structural Geology(including Lab.)(3)*                                                                                                                                                          |
| <b>GEOFYSICS</b>               |                                  | Engineering Geophysics(3)#                                                                                                                                                                                                                                      |
| <b>OCEANOGRAPHY</b>            |                                  | Introduction to Marine Chemistry(3)*<br>Introduction to Marine Physics(3)*<br>Marine Environmental Education (3)#<br>Ocean Dynamics (3)#                                                                                                                        |
| <b>104-2<br/>(2016 Spring)</b> | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                                                 |
| <b>ASTRONOMY</b>               | Seminar(II)(1)<br>Seminar(IV)(1) | Radio Astronomy(3)*<br><i>Tools for Modern Astronomy(3)#</i>                                                                                                                                                                                                    |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Atmospheric Dynamics(II)(3)*<br>Meteorological Statistics(3)*<br>Advanced Synoptic Meteorology(3)#<br>Geophysical Fluid Dynamics(3)#                                                                                                                            |
| <b>GEOLOGY</b>                 |                                  | <i>Continent and Supercontinent Evolution(3)*</i><br>Field Geology(including Lab.)(3)* 、<br><i>Geological Survey(3)*</i><br><i>Stress Regimes in Lithosphere(3)#</i>                                                                                            |
| <b>GEOFYSICS</b>               |                                  | Earthquakes of the Week(3)*<br>Paleomagnetism(3)*<br>Seismotectonics(3)*<br>Time Series Analysis (3)#                                                                                                                                                           |
| <b>OCEANOGRAPHY</b>            |                                  | Ocean Circulation(3)*<br>Applied Numerical Methods in Oceanography (3)#<br>Climatic and Oceanic Variability (3)#                                                                                                                                                |
| <b>EDUCATION</b>               |                                  | Historical Perspectives on Science Development(3)*                                                                                                                                                                                                              |
| <b>105-1<br/>(2016 Fall)</b>   | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                                                 |
| <b>ASTRONOMY</b>               | Seminar(I)(1)<br>Seminar(III)(1) | Active Galaxies(3)*<br>Advanced Astrophysics(3)#<br>Advanced Astronomical Observations(3)#<br><i>Interstellar Medium(3)#</i>                                                                                                                                    |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Climatology(3)*<br>Numerical Weather Prediction(3)*                                                                                                                                                                                                             |

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|                                |                                  | Synoptic Meteorology(3)*<br>Meso-scale Meteorology(3)#<br>Geophysical Fluid Dynamics(3)#                                                                                                                                              |
| <b>GEOLOGY</b>                 |                                  | <i>Economic Geology(3)*</i><br>Petrology(including Lab.)(3)*<br><i>Stable Isotope Geology(3)*</i><br><i>Core-Log Integration(3)#</i><br>Earth Sciences and Archaeology(3)#<br><i>Micro-Structural Geology(3)#</i>                     |
| <b>GEOFYSICS</b>               |                                  | Topics on Seismology (3)#                                                                                                                                                                                                             |
| <b>OCEANOGRAPHY</b>            |                                  | Introduction to Marine Chemistry(3)*<br>Introduction to Marine Physics(3)*<br>Numerical Ocean Circulation Modeling(3)#<br>Satellite Remote Data Analysis (I)#                                                                         |
| <b>EDUCATION</b>               |                                  | Historical Perspectives on Science Development(3)*                                                                                                                                                                                    |
| <b>105-2<br/>(2017 Spring)</b> | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                       |
| <b>ASTRONOMY</b>               | Seminar(II)(1)<br>Seminar(IV)(1) | Active Galaxies(3)*<br><i>Molecular Astrophysics(3)</i>                                                                                                                                                                               |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Atmospheric Dynamics (II)(3)*<br>Tropical Meteorology(3)*<br>Advanced Synoptic Meteorology(3)#<br>Research Methodologies in Atmospheric Sciences(3)#<br>Statistical Analysis in Climate Research(3)#<br>Boundary Layer Meteorology(3) |
| <b>GEOLOGY</b>                 |                                  | <i>Advanced Field Geological Techniques(3)*</i><br>Geology of Taiwan(3)*<br>Mineralogy (including Lab.)(3)*<br><i>Geo-technical Writing(3)#</i><br><i>Stress Regimes in Lithosphere(3)#</i>                                           |
| <b>GEOFYSICS</b>               |                                  | Earthquakes of the Week(3)*<br>Seismotectonics(3)*<br>Advanced Geophysics(3)#                                                                                                                                                         |
| <b>OCEANOGRAPHY</b>            |                                  | Ocean Dynamics(3)*<br>Satellite Oceanography(3)*<br>Satellite Remote Data Analysis(I)(3)#                                                                                                                                             |
| <b>106-1<br/>(2017 Fall)</b>   | <b>Required</b>                  | <b>Selected</b>                                                                                                                                                                                                                       |
| <b>ASTRONOMY</b>               | Seminar(I)(1)<br>Seminar(III)(1) | <i>Advanced Astronomical Observations(3)#</i><br><i>Advanced Astrophysics(3)#</i>                                                                                                                                                     |
| <b>ATMOSPHERIC SCIENCES</b>    |                                  | Synoptic Meteorology(3)*<br>Geophysical Fluid Dynamics(3)#<br>Meso-scale Meteorology(3)#<br>Research Methodologies in Atmospheric Sciences(3)#<br>Topics in Numerical Weather Prediction(3)#                                          |
| <b>GEOLOGY</b>                 |                                  | <i>Geochemistry(3)*</i><br>Petrology(including Lab.)(3)*<br><i>Stable Isotope Geology(3)*</i>                                                                                                                                         |

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|                        |                                  | Structural Geology(including Lab.)(3)*                                                                                                                                                                                  |
| GEOPHYSICS             |                                  | Theoretical Geophysics(3)#                                                                                                                                                                                              |
| OCEANOGRAPHY           |                                  | Innovation Trends in Oceanography(3)*<br>Introduction to Marine Physics(3)*<br>Marine Environmental Education(3)#                                                                                                       |
| EDUCATION              |                                  | Cognition and Instruction(3)#                                                                                                                                                                                           |
| 106-2<br>(2018 Spring) | Required                         | Selected                                                                                                                                                                                                                |
| ASTRONOMY              | Seminar(II)(1)<br>Seminar(IV)(1) | Radio Astronomy(3)*<br>Intergalactic Medium(3)#                                                                                                                                                                         |
| ATMOSPHERIC SCIENCES   |                                  | Atmospheric Dynamics(II)(3)*<br>Climatology(3)*<br>Meteorological Statistics(3)*<br>Advanced Synoptic Meteorology(3)#<br>Climate Change(3)#                                                                             |
| GEOLOGY                |                                  | Field Geology(including Lab.)(3)*<br>Geological Survey(3)*<br>Geology of Taiwan(3)*<br>Mineralogy(including Lab.)(3)*<br>Paleontology(including Lab.)(3)*                                                               |
| GEOPHYSICS             |                                  | Paleomagnetism(3)*<br>Seismotectonics(3)*                                                                                                                                                                               |
| OCEANOGRAPHY           |                                  | Satellite Remote Data Analysis (I)(3)#                                                                                                                                                                                  |
| INTEGRATED             |                                  | Earth System and Comparative Planetology(3)*                                                                                                                                                                            |
| 107-1<br>(2018 Fall)   | Required                         | Selected                                                                                                                                                                                                                |
| ASTRONOMY              | Seminar(I)(1)<br>Seminar(III)(1) | Advanced Astrophysics(3)#<br>Advanced Astronomical Observations(3)#                                                                                                                                                     |
| ATMOSPHERIC SCIENCES   |                                  | Climatology(3)*<br>Numerical Weather Prediction(3)*<br>Synoptic Meteorology(3)*<br>Geophysical Fluid Dynamics(3)#<br>Simulation and Diagnosis of Mesoscale Weathers(2)#<br>Statistical Analysis in Climate Research(3)# |
| GEOLOGY                |                                  | Petrology(including Lab.)(3)*<br>Planetary Geology(3)*<br>Stable Isotope Geology(3)*<br>Structural Geology(including Lab.)(3)*<br>Core-Log Integration(3)#<br>Earth Sciences and Archaeology(3)#                        |
| GEOPHYSICS             |                                  | Earthquakes of the Week(3)*                                                                                                                                                                                             |
| OCEANOGRAPHY           |                                  | Ocean Circulation(3)*<br>Introduction to Marine Physics(3)*<br>Marine Environmental Education(3)#                                                                                                                       |
| INTEGRATED             |                                  | Scientific Field Expeditions of Earth Systems(3)*                                                                                                                                                                       |
| 107-2<br>(2019 Spring) | Required                         | Selected                                                                                                                                                                                                                |

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| ASTRONOMY              | Seminar(II)(1)<br>Seminar(IV)(1) | Active Galaxies(3)*<br><i>Radio Astronomy(3)*</i><br><i>Interstellar Medium(3)#</i>                                                                                                                                                                                                                                                             |
| ATMOSPHERIC SCIENCES   |                                  | Tropical Meteorology(3)*<br>Atmospheric Dynamics (II)(3)*<br>Advanced Synoptic Meteorology(3)*<br><i>Research Methodologies in Atmospheric Sciences(3)#</i>                                                                                                                                                                                     |
| GEOLOGY                |                                  | Petrology (including Lab.)(3)*<br>Geodynamics(3)*<br>Field Geology(including Lab.)(3)*<br>Advanced Field Geological Techniques(3)*<br>Sedimentology and Stratigraphy(3)*<br><i>Continent and Supercontinent Evolution(3)*</i><br>Principle of Geotechnical Engineering(3)*<br>Geology of Taiwan(3)*<br><i>Stress Regimes in Lithosphere(3)#</i> |
| GEOPHYSICS             |                                  | Topics in Geophysics(3)*<br>Physics and Chemistry of the Earth's Interior(3)*<br>Seismotectonics(3)*                                                                                                                                                                                                                                            |
| OCEANOGRAPHY           |                                  | Water Wave Theory(3)*<br>Satellite Remote Data Analysis (I)(3)#                                                                                                                                                                                                                                                                                 |
| INTEGRATED             |                                  | Earth System and Comparative Planetology(3)*                                                                                                                                                                                                                                                                                                    |
| 108-1<br>(2019 Fall)   | Required                         | Selected                                                                                                                                                                                                                                                                                                                                        |
| ASTRONOMY              | Seminar(I)(1)<br>Seminar(III)(1) | <i>Advanced Astrophysics(3)#</i><br><i>Advanced Astronomical Observations(3)#</i>                                                                                                                                                                                                                                                               |
| ATMOSPHERIC SCIENCES   |                                  | Climatology(3)*<br>Synoptic Meteorology(3)*<br>Topics in Meteorological Phenomena in Eastern Asia(3)#<br>Geophysical Fluid Dynamics(3)#<br>Research Methodologies in Atmospheric Sciences(3)#                                                                                                                                                   |
| GEOLOGY                |                                  | <i>Geochemistry(3)*</i><br>Mineralogy (including Lab.)(3)*<br>Structural Geology(including Lab.)(3)*<br>Introduction to Petroleum Geology (3)*<br><i>Core-Log Integration(3)#</i>                                                                                                                                                               |
| GEOPHYSICS             |                                  | Earth Science Data Processing(3)*<br>Earthquakes of the Week(3)*<br><i>Theoretical Geophysics(3)#</i>                                                                                                                                                                                                                                           |
| OCEANOGRAPHY           |                                  | Ocean Circulation(3)*<br>Introduction to Marine Physics(3)*<br>Innovation Trends in Oceanography(3)*<br>Marine Environmental Education(3)#                                                                                                                                                                                                      |
| INTEGRATED             |                                  | Earth Science Practicum(II)(3)*                                                                                                                                                                                                                                                                                                                 |
| 108-2<br>(2020 Spring) | Required                         | Selected                                                                                                                                                                                                                                                                                                                                        |
| ASTRONOMY              | Seminar(II)(1)<br>Seminar(IV)(1) | Intergalactic Medium (3)#<br><i>Open Cluster (3)</i>                                                                                                                                                                                                                                                                                            |

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| ATMOSPHERIC SCIENCES   |                                  | Advanced Synoptic Meteorology(3)#<br>Climate Change(3)#<br>Meteorological Statistics(3)*<br>Atmospheric Dynamics (II) (3)*                                                                                                                                          |
| GEOLOGY                |                                  | Stable Isotope Geology(3)*<br>Petrology (including Lab.) (3)*<br>Field Geology (including Lab.) (3)*<br>Geology of Taiwan(3)*<br>Principle of Geotechnical Engineering(3)*<br><i>Economic Geology(3)*</i>                                                           |
| GEOFYSICS              |                                  | Seismotectonics(3)*<br>Paleomagnetism(3)*<br>Geophysical Planetary Exploration(3)*                                                                                                                                                                                  |
| OCEANOGRAPHY           |                                  | Water Wave Theory(3)*<br>Satellite Remote Data Analysis (I)(3)#                                                                                                                                                                                                     |
| INTEGRATED             |                                  | Earth System and Comparative Planetology(3)*                                                                                                                                                                                                                        |
| 109-1<br>(2020 Fall)   | Required                         | Selected                                                                                                                                                                                                                                                            |
| ASTRONOMY              | Seminar(I)(1)<br>Seminar(III)(1) | Advanced Astronomical Observations(3)#<br>Advanced Astrophysics(3)#<br>High Energy Astrophysics(3)#<br>Radio Astronomy(3)*<br><i>Statistics for Astronomy(3)#</i>                                                                                                   |
| ATMOSPHERIC SCIENCES   |                                  | Climatology(3)*<br>Geophysical Fluid Dynamics(3)#<br>Synoptic Meteorology(3)*<br>Statistical Analysis in Climate Research(3)#<br>Research Methodologies in Atmospheric Sciences(3)#                                                                                 |
| GEOLOGY                |                                  | <i>Advanced Igneous Petrology(3)#</i><br><i>Geochemistry (3)*</i><br>Introduction to Petroleum Geology(3)*<br><i>Micro-Structural Geology(3)#</i><br>Mineralogy (including Lab.)*<br>Sedimentology and Stratigraphy(3)*<br>Structural Geology (including Lab.) (3)* |
| GEOFYSICS              |                                  | Earthquakes of the Week(3)*<br>Earth Science Data Processing(3)*<br>The Dynamics of Fault Zone(3)#                                                                                                                                                                  |
| OCEANOGRAPHY           |                                  | Innovation Trends in Oceanography(3)*<br>Introduction to Marine Physics(3)*<br>Marine Environmental Education(3)#<br>Ocean Circulation(3)*                                                                                                                          |
| INTEGRATED             |                                  | Earth Science Practicum (II) (3)*<br>Introduction to Marine Geology(3)*<br>Scientific Field Expeditions of Earth Systems) (3)*                                                                                                                                      |
| 109-2<br>(2021 Spring) | Required                         | Selected                                                                                                                                                                                                                                                            |
| ASTRONOMY              | Seminar(II)(1)                   | Active Galaxies(3)*                                                                                                                                                                                                                                                 |

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|                      | Seminar(IV)(1) |                                                                                                                                                                                                                                                                                                                                                                              |
| ATMOSPHERIC SCIENCES |                | Atmospheric Dynamics (II)(3)*                                                                                                                                                                                                                                                                                                                                                |
| GEOLOGY              |                | <b>Continent and Supercontinent Evolution(3)*</b><br>Earth Science Aspects of Renewable Energy(3)*<br><b>Field Geology (including Lab.)(3)*</b><br><b>Geodynamics(3)*</b><br>Geology of Taiwan(3)*<br>Petroleum Geochemistry(3)*<br>Petrology (including Lab.)(3)*<br>Principle of Geotechnical Engineering(3)*<br><b>Regional Geology(3)*</b><br><b>Strain Analysis(3)#</b> |
| GEOFYSICS            |                | Geophysical Planetary Exploration(3)*<br>Physics and Chemistry of the Earth's Interior(3)*<br>Topics on Seismology(3)#                                                                                                                                                                                                                                                       |
| OCEANOGRAPHY         |                | Satellite Data Analysis Techniques Applied to Oceanography(3)*<br>Tropical Meteorology(3)*                                                                                                                                                                                                                                                                                   |
| INTEGRATED           |                | Earth System and Comparative Planetology(3)*                                                                                                                                                                                                                                                                                                                                 |