

(Discontinued to new students as of fall 2022, new students should do the Environmental Data Science track)

Geospatial Information Science



Why study geospatial information science?

The geospatial information science track introduces students to computer-based analysis of geographic data and the theory and practice of aerial and satellite imagery, geographical information systems (GIS), and spatial analysis, applied to natural resource assessment and to monitoring human impacts on the environment. The major trains students to become GIS and remote sensing specialists for employment in government agencies, profit and non-profit organizations. In addition to course work, student internships with private and government agencies to gain practical experience are encouraged and we can assist with locating an appropriate internship program. All public and private programs that manage natural resources have needs for spatial information technology specialists. Graduates will be well equipped for land and resource management positions in industry, non-profit and government agencies, and for advanced studies in geography, ecology, environmental sciences and management.

Preparatory Subject Matter Requirements

| Preparatory Subject Matter | | Quarter(s) Offered | Units | Completed | Notes |
|--|---------------------------------------|-----------------------|---------|-----------|-------------------------------------|
| Written and Oral Expression | | | | | |
| UWP 101, or any from the 102 or 104 series | Upper Division Writing | I, II, III, IV | 4 | _____ | <u>May test out of requirement</u> |
| CMN 1, 3V, 3Y, or DRA 10 | Communication | I, II, III, IV | 4 | _____ | _____ |
| Biological Sciences | | | | | |
| BIS 2A | Essentials of Life on Earth | I, II, III, IV | 5 | _____ | _____ |
| BIS 2B | Principles of Ecology and Evolution | I, II, III, IV | 5 | _____ | _____ |
| BIS 2C | Biodiversity and the Tree of Life | I, II, III, IV | 5 | _____ | _____ |
| Geology | | | | | |
| <i>Choose one of the following</i> | | | | | |
| GEL 1 | The Earth | I, II, III | 4 | _____ | _____ |
| GEL 50 (recommended) | Physical Geology | I, II, III | 3 | _____ | _____ |
| Chemistry | | | | | |
| CHE 2A or 2AH | General Chemistry | I, II, IV | 5 | _____ | _____ |
| CHE 2B or 2BH | General Chemistry | II, III, IV | 5 | _____ | _____ |
| Physics | | | | | |
| <i>Complete either 1AB or 7ABC</i> | | | | | |
| PHY 1A | General Physics | I, II, IV | 3 | _____ | _____ |
| PHY 1B | General Physics | II, III | 3 | _____ | _____ |
| PHY 7A | General Physics | I, II, III, IV | 4 | _____ | _____ |
| PHY 7B | General Physics | I, II, III, IV | 4 | _____ | _____ |
| PHY 7C | General Physics | I, II, III, IV | 4 | _____ | _____ |
| Economics | | | | | |
| ECN 1A, 1AV, or 1AY | Principles of Microeconomics | I, II, III, IV | 4 | _____ | _____ |
| Mathematics | | | | | |
| MAT 16A and 16B | Short Calculus | I, II, III, IV | 3, 3 | _____ | <u>Being phased out as of 23-24</u> |
| MAT 17A and 17B | Calculus for Biology & Medicine | I, II, III, IV | 4, 4 | _____ | <u>MAT 17AB recommended</u> |
| MAT 19A and 19B and 19C | Calculus for Data-Driven Applications | I, II, III, IV | 4, 4, 4 | _____ | <u>Must take A, B, and C</u> |
| MAT 21A and 21B | Calculus | I, II, III, IV | 4, 4 | _____ | _____ |
| Environmental Science and Policy | | | | | |
| ESP 1 | Environmental Analysis | I, IV | 4 | _____ | _____ |

I = fall quarter, II = winter quarter, III = spring quarter, IV = summer session

*Course is offered in odd years only (2023, 2025, etc.)

**Course is offered in even years only (2024, 2026, etc.)

Core Subject Matter Requirements

NOTE: Students graduating with this major are required to attain at least a C average (2.0 GPA) in all courses taken at the university in Depth Subject Matter *and* pass all coursework. See requirements of the College of Agriculture & Environmental Science in the UC Davis General Catalog.

| Depth Subject Matter | Prerequisites | Qtr(s) | Units | Completed | |
|---|--|---|----------------|-----------|-------|
| Global Environment | | | | | |
| ESM 120 | Global Environmental Interactions | One college-level chemistry and biology course | II | 4 | _____ |
| Ecology | | | | | |
| <i>(Choose one of the following)</i> | | | | | |
| ESP 100 | General Ecology | BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; STA 13 recommended | I, II, IV | 4 | _____ |
| EVE 101 | Introduction to Ecology | BIS 2A-C; MAT 16A-B or 17A-B or 21A-B; or equivalent | I, II, III, IV | 4 | _____ |
| Policy | | | | | |
| ESP 162 | Environmental Policy | ECN 1A or ECN 1AV or ECN 1AY | II | 4 | _____ |
| Statistics | | | | | |
| <i>(Choose one of the following – Statistics 100 recommended)</i> | | | | | |
| STA 13 | Elementary Statistics | Two years of high school algebra or equivalent in college | I, II, III, IV | 4 | _____ |
| STA 100 | Applied Statistics for Biological Sciences | MAT 16B or 17B or 21B with a C- or better | I, II, III, IV | 4 | _____ |
| Environmental Monitoring | | | | | |
| <i>(Choose one of the following)</i> | | | | | |
| ATM 124 | Meteorological Instruments & Observations | ATM 60 | I | 3 | _____ |
| ESM 108 | Environmental Monitoring | ESP 100 or EVE 101 or SSC 100 or WFC 100 or equivalent | III | 3 | _____ |
| ESP 151L | Limnology Lab | ESP 151 (can be concurrent) | III | 3 | _____ |
| ESP 179 | Environmental Impact Assessment | ESP 1 or the equivalent | II, IV | 4 | _____ |
| Environmental Data Science | | | | | |
| <i>(Choose one of the following)</i> | | | | | |
| ABT/LDA 150 | Introduction to GIS | None | I, II, III | 4 | _____ |
| ESP 106 | Environmental Data Science | STA 13 or 32 or 100 (can be concurrent) | II | 4 | _____ |
| Internship | | | | | |
| ESM/ESP 92/192 Internship | | Upper division standing, permission of instructor Variable unit – must take at least 3 units of internship May complete internship in a different area with prior approval (e.g.: PLS, SSC, ATM) | I, II, III, IV | 3 | _____ |
| Capstone | | | | | |
| ESM 195 | Integrating Env Science & Management | Senior standing in ESM | III | 2 | _____ |
| Honors Thesis (Optional) | | | | | |
| ESM 194H | Senior Honors Thesis | Senior standing, Overall GPA of 3.50 or higher; Consent of the lead faculty advisor | | 2-6 | _____ |

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Geospatial Information Science

| Required Courses | | Prerequisites | Qtr(s) | Units | Completed |
|---|---|---|----------------|-------|-----------|
| Select two GIS courses | | | | | |
| ABT 181N* | Concepts & Methods in GIS | LDA 150 or consent of instructor | II | 4 | _____ |
| ABT/HYD 182** | Environmental Analysis with GIS | ABT 150 or equiv GIS experience, biology and/or ecology courses rec. | II | 4 | _____ |
| ESM 185 | Aerial Photo Interp. & Remote Sensing | Upper division standing | I | 4 | _____ |
| ESM 186 | Environmental Remote Sensing | MAT 16B; PHY 7C or 9B; upper division standing; LDA 150 rec. | II | 5 | _____ |
| Select two environmental policy courses | | | | | |
| ESP/ECI 163** | Energy & Env Aspects of Transportation | Upper division standing in environmental studies | I | 4 | _____ |
| ESP 165 | Climate Policy | ECN 1A or 1AV or ESP 1 or consent of instructor | I | 3 | _____ |
| ESP 166 | Ocean & Coastal Policy | ESP 1 or consent of instructor | I | 3 | _____ |
| ESP 169** | Water Policy & Politics | ECN 1A or POL 1 recommended | III | 3 | _____ |
| ESP 171 | Urban & Regional Planning | ESP 1 or ESP 161 or ESP 179 recommended | III, IV | 4 | _____ |
| ESP 172 | Public Lands Management | ECN 1A and POL 1 recommended | I | 4 | _____ |
| ESP 174 | Environmental Justice Policy & Practice | ESP 1 or equivalent recommended | III | 4 | _____ |
| ESP 179 | Environmental Impact Assessment | ESP 1 or the equivalent | II, IV | 4 | _____ |
| SOC 160 | Sociology of the Environment | SOC 1 or 2 or 3 recommended | I | 4 | _____ |
| Select two quantitative analysis courses | | | | | |
| ESP 106 | Environmental Data Science | STA 13 or 32 or 100 (can be concurrent) | II | 4 | _____ |
| ESP 121 | Population Ecology | BIS 2B; MAT 16B or 17B or 21B or 21BH | II | 4 | _____ |
| STA 104 | Nonparametric Statistics | STA 13 or 32 or 100 with a C- or better | II, III | 4 | _____ |
| STA 106 | Analysis of Variance | STA 13 or 32 or 100 with a C- or better | I, II, III, IV | 4 | _____ |
| STA 108 | Regression Analysis | STA 13 or 32 or 100 with a C- or better | I, II, III, IV | 4 | _____ |
| STA 130A | Mathematical Statistics: Brief Course | MAT 16C or 17C or 21C; STA 13 or 32 or 100; all with a C- or better | I | 4 | _____ |
| STA 130B | Mathematical Statistics: Brief Course | STA 130A or 131A or MAT 135A with a C- or better | II | 4 | _____ |
| STA 137 | Applied Time Series Analysis | STA 108 with a C- or better | I, II | 4 | _____ |
| Select three environmental science courses, must select at least one from section A and one from section B | | | | | |
| A – Physical | | | | | |
| ATM 110* | Weather Observation & Analysis | ATM 60 | II | 4 | _____ |
| ATM 116 | Modern Climate Change | None | I | 3 | _____ |
| ATM 133 | Biometeorology | MAT 16B; one course in a biological discipline or consent of instructor | II | 4 | _____ |
| SSC 100 | Principles of Soil Science | College-level course in each of CHE, PHY, BIS, and GEL recommended | I | 5 | _____ |
| B – Biomes | | | | | |
| ESP 124 | Marine and Coastal Field Ecology | Acceptance into the Bodega Marine Lab summer program | IV | 3 | _____ |
| ESP/GEL 150C | Biological Oceanography | Acceptance into the Bodega Marine Lab summer program | IV | 4 | _____ |
| ESP 151 | Limnology | BIS 2A and 2B; BIS 2C and ESP 100 or EVE 101 recommended | III | 4 | _____ |
| ESP 152 | Coastal Oceanography | Acceptance into the Bodega Marine Lab summer program | IV | 3 | _____ |
| ESP 155 | Wetland Ecology | BIS 2A or equivalent; ESP 100 or EVE 101 recommended | | 4 | _____ |
| GEL 136 | Ecogeomorphology of Rivers & Streams | Enrollment by application only, not offered every year | III | 5 | _____ |
| PLS 101 | Agriculture & the Environment | PLS 2 or consent of instructor | II | 3 | _____ |
| PLB/EVE 117 | Plant Ecology | BIS 2A-C; PLB 111 recommended | I | 4 | _____ |

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