

# Environmental and Conservation Sciences Doctorate

## Department Information

- **Program Information:**  
ndsu.edu/programs/graduate/environmental-and-conservation-sciences (<http://ndsu.edu/programs/graduate/environmental-and-conservation-sciences/>)
- **Department Web Site:**  
ndsu.edu/ecs/ (<http://ndsu.edu/ecs/>)
- **Application Deadline:**  
Fall semester international applications - May 1; Spring semester international applications- August 1; Domestic applications must be received at least one month prior to the start of the semester
- **Credential Offered:**  
Ph.D.
- **English Proficiency Requirements:**  
TOEFL ibt 79; IELTS 6.5; Duolingo 105

**Apply Now ([https://ndsugrad.my.site.com/Application/TX\\_SiteLogin/?startURL=/Application/TargetX\\_Portal\\_\\_PB](https://ndsugrad.my.site.com/Application/TX_SiteLogin/?startURL=/Application/TargetX_Portal__PB))**

Each Ph.D. student will complete at least 27 credits of didactic courses plus the ECS graduate seminar for 1 credit. The didactic courses will include: 3 core courses (9 credits), UNIV 720 Scientific Integrity, a minimum of 14-15 credits from a chosen track, and 2-3 credits of electives from another track or other NDSU courses numbered 601-689, 691; 700-789, 791 or 800-889, 891. The 15 track credits must be from at least 2 course categories. Two of the three courses must come from outside of the student's chosen track. Of the 27 didactic course credits, a total of 15 must be at the 700-800 level. A total of 90 credits are required.

| Code                                       | Title                                                               | Credits |
|--------------------------------------------|---------------------------------------------------------------------|---------|
| <b>Environmental Social Sciences Track</b> |                                                                     |         |
| ECON 681                                   | Natural Resource Economics                                          | 3       |
| ECS 770                                    | Environmental Law and Policy                                        | 3       |
| HIST 634                                   | Environmental History                                               | 3       |
| or HIST 710                                | Research Seminar in North American History                          |         |
| or HIST 780                                | Readings in World History                                           |         |
| NRM 631                                    | National Environmental Policy Act & Environmental Impact Assessment | 3       |
| NRM 702                                    | Natural Resources Management Planning                               | 3       |
| SOC 631                                    | Environmental Sociology                                             | 3       |
| <b>Environmental Sciences Track</b>        |                                                                     |         |
| CE 770                                     | Hazardous Waste Site Remediation                                    | 3       |
| GEOL 614                                   | Hydrogeology                                                        | 3       |
| MICR 652                                   | Microbial Ecology                                                   | 3       |
| PH 720                                     |                                                                     | 3       |
| <b>Conservation Biology Track</b>          |                                                                     |         |
| BOT 862                                    |                                                                     | 3       |
| BOT 864                                    |                                                                     | 3       |
| ZOO 675                                    |                                                                     | 3       |
| ZOO 850                                    |                                                                     |         |

## CONSERVATIVE BIOLOGY TRACK - TOTAL 18 CREDITS

| Code                                 | Title           | Credits |
|--------------------------------------|-----------------|---------|
| <b>Biodiversity</b>                  |                 |         |
| Select 3-9 credits of the following: |                 |         |
| BIOL 681                             | Wetland Science |         |

BOT 717

ENT 750 Systematic Entomology

RNG 716

ZOO 650

ZOO 652

ZOO 654

ZOO 658

**Ecology and Evolution**

Select 3-9 credits of the following:

BIOL 850

BIOL 859 Evolution

BOT 660

BOT 862

BOT 864

ENT 765

ENT 770 Writing a Scientific Literature Review

GEOL 640

MICR 652 Microbial Ecology

PLSC 631 Intermediate Genetics

PLSC 751 Advanced Plant Genetics

PLSC 781

RNG 765 Analysis Of Ecosystems

SOIL 610 Soils and Land Use

SOIL 647 Microclimatology

ZOO 662

ZOO 670

ZOO 850

ZOO 860

ZOO 870

**Human Dimensions and Management**

Select 3-9 credits of the following:

ANTH 662 Anthropology and the Environment

COMM 783 Advanced Organizational Communication I

CE 678 Water Quality Management

ECON 682 Environmental Economics

POLS 642 Global Policy Issues

POLS 650 Politics of the Developing Countries

RNG 656 Ecological Restoration

ZOO 675

ZOO 676

ZOO 677

ZOO 850

**Research Tools**

Select 3-9 credits of the following:

CE 677 Applied Hydrology

GEOG 655 Introduction to Geographic Information Systems

GEOG 656 Advanced Geographic Information Systems

GEOL 660 Biogeochemistry

GEOL 760 Advanced Biogeochemistry

PLSC 724 Field Design I

PSYC 640 Experimental Methods

RNG 650 Range Plants

|          |                                     |
|----------|-------------------------------------|
| SOC 701  | Quantitative Methods                |
| SOIL 784 |                                     |
| STAT 661 | Applied Regression Models           |
| STAT 662 | Introduction to Experimental Design |
| STAT 663 | Nonparametric Statistics            |
| STAT 665 | Meta-Analysis Methods               |
| STAT 670 | Statistical SAS Programming         |
| STAT 730 | Biostatistics                       |
| STAT 761 | Advanced Regression                 |
| STAT 770 | Survival Analysis                   |

## ENVIRONMENTAL SCIENCES TRACK-TOTAL 17 CREDITS

| Code                                 | Title                                            | Credits |
|--------------------------------------|--------------------------------------------------|---------|
| <b>Water Sciences</b>                |                                                  |         |
| Select 3-9 credits of the following: |                                                  |         |
| ABEN 664                             | Resource Conservation and Irrigation Engineering |         |
| ABEN 765                             | Small Watershed Hydrology and Modeling           |         |
| CE 610                               | Water & Wastewater Engineering                   |         |
| CE 677                               | Applied Hydrology                                |         |
| CE 676                               | Watershed Modeling                               |         |
| CE 678                               | Water Quality Management                         |         |
| CE 679                               |                                                  |         |
| CE 776                               | Ground Water and Seepage                         |         |
| CE 779                               | Watershed Water Quality Modeling                 |         |
| CE 796                               | Special Topics                                   |         |
| GEOL 640                             |                                                  |         |
| ZOO 670                              |                                                  |         |
| <b>Soil and Solid Waste</b>          |                                                  |         |
| Select 3-9 credits of the following: |                                                  |         |
| ABEN 696                             | Special Topics                                   |         |
| CE 672                               | Solid and Hazardous Waste Management             |         |
| CE 770                               | Hazardous Waste Site Remediation                 |         |
| SOIL 610                             | Soils and Land Use                               |         |
| SOIL 633                             | Soil Ecohydrology and Physics                    |         |
| SOIL 733                             | Advanced Soil Nutrient Cycling                   |         |
| <b>Environmental Management</b>      |                                                  |         |
| Select 3-9 credits of the following: |                                                  |         |
| CE 672                               | Solid and Hazardous Waste Management             |         |
| CE 678                               | Water Quality Management                         |         |
| COMM 783                             | Advanced Organizational Communication I          |         |
| RNG 656                              | Ecological Restoration                           |         |
| ZOO 675                              |                                                  |         |
| ZOO 676                              |                                                  |         |
| ZOO 677                              |                                                  |         |
| <b>Research Tools</b>                |                                                  |         |
| Select 3-9 credits of the following: |                                                  |         |
| ABEN 682                             | Instrumentation & Measurements                   |         |
| ABEN 696                             | Special Topics                                   |         |
| CE 677                               | Applied Hydrology                                |         |
| GEOG 655                             | Introduction to Geographic Information Systems   |         |
| GEOG 656                             | Advanced Geographic Information Systems          |         |
| GEOL 660                             | Biogeochemistry                                  |         |

|          |                                     |
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| GEOL 760 | Advanced Biogeochemistry            |
| IME 660  | Evaluation of Engineering Data      |
| RNG 650  | Range Plants                        |
| STAT 662 | Introduction to Experimental Design |
| STAT 725 | Applied Statistics                  |
| STAT 761 | Advanced Regression                 |

## ENVIRONMENTAL AND SOCIAL SCIENCES TRACK-TOTAL 17 CREDITS

| Code                                   | Title                                                               | Credits |
|----------------------------------------|---------------------------------------------------------------------|---------|
| <b>Social Science Theory</b>           |                                                                     |         |
| Select 3-9 credits of the following:   |                                                                     |         |
| AGEC 741                               | Advanced Microeconomics                                             |         |
| ANTH 680                               | Development of Anthropological Theory                               |         |
| COMM 711                               | Communication Theory                                                |         |
| ECON 640                               | Game Theory and Strategy                                            |         |
| POLS 720                               |                                                                     |         |
| SOC 622                                | Development Of Social Theory                                        |         |
| SOC 723                                | Social Theory                                                       |         |
| <b>Cultural and Behavioral Aspects</b> |                                                                     |         |
| Select 3-9 credits of the following:   |                                                                     |         |
| AGEC 711                               | Applied Risk Analysis I                                             |         |
| ANTH 662                               | Anthropology and the Environment                                    |         |
| ANTH 664                               | Disaster and Culture                                                |         |
| ECON 656                               |                                                                     |         |
| ECON 681                               | Natural Resource Economics                                          |         |
| ECON 682                               | Environmental Economics                                             |         |
| HIST 634                               | Environmental History                                               |         |
| POLS 642                               | Global Policy Issues                                                |         |
| POLS 653                               | Environmental Policy and Politics                                   |         |
| SOC 631                                | Environmental Sociology                                             |         |
| SOC 639                                | Social Change                                                       |         |
| SOC 643                                |                                                                     |         |
| <b>Management Techniques</b>           |                                                                     |         |
| Select 3-9 credits of the following:   |                                                                     |         |
| COMM 783                               | Advanced Organizational Communication I                             |         |
| GEOL 660                               | Biogeochemistry                                                     |         |
| NRM 631                                | National Environmental Policy Act & Environmental Impact Assessment |         |
| NRM 632                                |                                                                     |         |
| NRM 653                                | Rangeland Resources Watershed Management                            |         |
| NRM 701                                | Terrestrial Resources Management                                    |         |
| NRM 702                                | Natural Resources Management Planning                               |         |
| RNG 654                                | Wetland Resources Management                                        |         |
| RNG 656                                | Ecological Restoration                                              |         |
| SOC 604                                | Community Assessment                                                |         |
| TL 755                                 |                                                                     |         |
| ZOO 675                                |                                                                     |         |
| ZOO 676                                |                                                                     |         |
| ZOO 850                                |                                                                     |         |
| <b>Research Tools</b>                  |                                                                     |         |
| Select 3-9 credits of the following:   |                                                                     |         |
| AGEC 701                               | Research Methods                                                    |         |
| AGEC 739                               | Analytical Methods for Applied Economics                            |         |

|          |                                                    |
|----------|----------------------------------------------------|
| BIOL 850 |                                                    |
| COMM 700 | Research Methods in Communication                  |
| COMM 701 | Advanced Research Methods in Communication I       |
| COMM 704 | Qualitative Research Methods in Communication      |
| COMM 707 | Quantitative Research Methods in Communication     |
| ECON 610 | Econometrics                                       |
| ECON 710 | Advanced Econometrics                              |
| EMGT 614 |                                                    |
| ENGL 656 | Literacy, Culture and Identity                     |
| ENGL 758 | Topics in Rhetoric, Writing, and Culture           |
| GEOG 655 | Introduction to Geographic Information Systems     |
| GEOG 656 | Advanced Geographic Information Systems            |
| PSYC 640 | Experimental Methods                               |
| RNG 652  | Managing Natural and Rangeland Resources using GIS |
| RNG 765  | Analysis Of Ecosystems                             |
| SOC 700  | Qualitative Methods                                |
| SOC 701  | Quantitative Methods                               |
| STAT 660 | Applied Survey Sampling                            |
| STAT 661 | Applied Regression Models                          |
| STAT 662 | Introduction to Experimental Design                |
| STAT 663 | Nonparametric Statistics                           |
| STAT 665 | Meta-Analysis Methods                              |
| STAT 670 | Statistical SAS Programming                        |
| STAT 725 | Applied Statistics                                 |
| STAT 726 | Applied Regression and Analysis of Variance        |
| STAT 730 | Biostatistics                                      |
| STAT 761 | Advanced Regression                                |
| STAT 770 | Survival Analysis                                  |

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## Admission and Application Requirements

- Graduate School admission and application requirements are found on the Admission Information (<https://catalog.ndsu.edu/past-bulletin-archive/2025-2026/graduate/admission-information/>) page.
- In addition, this program requires applicants to have an ECS affiliated faculty member that has agreed to to admit the applicant to their lab and made arrangements for stipend and research funding.
  - Using the department website, applicants should contact ECS faculty members who share their research interests