About the University Bulletins

The Office of the University Registrar is responsible for compiling, producing, and maintaining the bulletin for each school at Duke University. The content for the bulletins is established by the schools in conjunction with the Duke University Bulletins Policy. All bulletins are published online and serve as static documents for historical records of the university. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

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The information in this bulletin applies to the academic year 2022-2023 and is accurate and current, to the greatest extent possible, as of August 2022. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures. Duke University is committed to encouraging and sustaining a learning and work community that is free from prohibited discrimination and harassment. The institution prohibits discrimination on the basis of age, color, disability, gender, gender identity, gender expression, genetic information, national origin, race, religion, sex, sexual orientation, or veteran status, in the administration of its educational policies, admission policies, financial aid, employment, or any other institution program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students.

Sexual harassment and sexual misconduct are forms of sex discrimination and prohibited by the institution. Duke has designated the Vice President for Institutional Equity and Chief Diversity Officer as the individual responsible for the coordination and administration of its nondiscrimination and harassment policies. The Office for Institutional Equity is located in Smith Warehouse, 114 S. Buchanan Blvd., Bay 8, Durham, NC 27708, and can be contacted at (919) 684-8222.

Questions or comments about harassment or discrimination can be directed to the following administrator in the Office for Institutional Equity:

Discrimination in employment or educational programs and activities
Cynthia Clinton, AVP Harassment and Discrimination Prevention and Compliance
Office for Institutional Equity
114 S. Buchanan Blvd., Bay 8
Durham, NC 27708
(919) 668-6214

Additional information, including the complete text of Duke’s Policy on Prohibited Discrimination, Harassment, and Related Misconduct and appropriate complaint procedures, may be found by visiting the Office for Institutional Equity’s website at oie.duke.edu. For further information, visit ed.gov/about/offices/list/ocr/index.html, or call (800) 421-3481.

Duke University recognizes and utilizes electronic mail as a medium for official communications. The university provides all students with email accounts as well as access to email services from public clusters if students do not have personal computers of their own. All students are expected to access their email accounts on a regular basis to check for and respond as necessary to such communications.
Information that the university is required to make available under the federal Clery Act is available by visiting the Records Division, Duke University Police Department, 502 Oregon Street, Durham, NC 27708, or by calling (919) 684-4602. See police.duke.edu/news-stats/clery for more details.

The Family Educational Rights & Privacy Act (FERPA), 20 U.S.C § 1232g; 34 CFR Part 99, is a federal law that guides the release of students’ education records, of which disciplinary records are a part. For additional information about FERPA, see ed.gov/policy/gen/guid/fpco/ferpa/index.html.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, master’s, doctorate, and professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097 or call (404) 679-4500 for questions about the accreditation of Duke University.

This publication is available in alternative format on request. Please call (919) 684-2813.
Mission Statement

Approved by the Duke University Board of Trustees October 1, 1994, and revised February 23, 2001, the Mission Statement for Duke University reads as follows:

"James B. Duke’s founding Indenture of Duke University directed the members of the University to 'provide real leadership in the educational world' by choosing individuals of 'outstanding character, ability, and vision' to serve as its officers, trustees and faculty; by carefully selecting students of 'character, determination and application;' and by pursuing those areas of teaching and scholarship that would 'most help to develop our resources, increase our wisdom, and promote human happiness.'

"To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to promote an intellectual environment built on a commitment to free and open inquiry; to help those who suffer, cure disease, and promote health, through sophisticated medical research and thoughtful patient care; to provide wide-ranging educational opportunities, on and beyond our campuses, for traditional students, active professionals and life-long learners using the power of information technologies; and to promote a deep appreciation for the range of human difference and potential, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom and truth.

"By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the University; to contribute in diverse ways to the local community, the state, the nation and the world; and to attain and maintain a place of real leadership in all that we do."
Duke University: A Brief Narrative History

Duke University traces its origins to a small school that opened in 1838 in Randolph County, North Carolina. Originally a preparatory school for young men called the Union Institute Academy, it was then chartered as a teaching college named Normal College by the state of North Carolina in 1851. The school underwent another transformation in 1859 when it turned to the Methodist Church for financial support. Reflecting the new partnership, the school's name changed to Trinity College.

From 1842 to 1882, Braxton Craven served as the principal and then president of the institution, overseeing its transition from a tiny schoolhouse to a full-fledged college. Shortly before his death, he helped to establish the Cherokee Industrial School at Trinity College, one of numerous schools established in the United States to “westernize” indigenous students, in this case boys and young men from the Eastern Band of the Cherokee. The School at Trinity lasted only a few years. It is worth noting that Craven enslaved several Black people prior to the Civil War, and that a number of other faculty and trustees were also enslavers.

John F. Crowell, Trinity College’s president from 1887-1894, suggested that moving the college to an urban setting would attract more students, faculty, and financial support. With Crowell’s encouragement, the trustees agreed to move the college, and after a spirited competition among regional cities, Trinity opened in Durham in 1892. Local tobacco magnates Washington Duke and Julian S. Carr assisted in providing land and money to Trinity. In 1897, at Washington Duke’s request, the school began admitting women as regular students, making it an early co-educational institution. Carr’s support for Trinity College was recognized with a building named in his honor in 1930. His name was removed in 2018 in light of his virulent white supremacist beliefs and actions.

Trinity prospered in its new location, and in 1924 the school was again transformed through philanthropy. Washington Duke’s son James Buchanan Duke established the Duke Endowment, and the charitable foundation infused the college with funds. The trustees changed Trinity College’s name to Duke University as a memorial to his father. The new funds supported the construction of a new campus, designed in a Gothic style by the Philadelphia architectural firm of Horace Trumbauer. The chief designer of West Campus, as well as the re-envisioned East Campus, was Julian Abele, a Black architect whose role in creating the architecture of Duke University was largely overlooked during his lifetime. In 2016, the main quad on West Campus was renamed Abele Quad in his honor.

President William P. Few (1910-1940) oversaw this metamorphosis of a small college into a complex university. In 1930, the Trinity College site (today’s East Campus) became the Woman’s College, while the West Campus served as the grounds for the all-male Trinity College. In 1972, Trinity College merged both colleges of men and women into what is now known as Trinity College of Arts and Sciences. Other schools include the School of Religion and Graduate School founded in 1926, the School of Medicine and hospital in 1930, and the School of Nursing in 1931. Originally established in 1904, the Law School reorganized in 1930. In 1938, what is today’s Nicholas School of the Environment opened, and in 1939 the university formed what is now known as the Pratt School of Engineering. The last of James B. Duke’s desires for the university was fulfilled when what is now the Fuqua School of Business, opened in 1969. The Sanford School of Public Policy became Duke’s tenth school in 2005. The school was named for President Terry Sanford, formerly the governor of North Carolina, who supported a number of initiatives in the 1970s and 1980s to build Duke’s reputation for excellence, growing the university’s national and international profile.

Long a segregated institution, Duke first admitted Black graduate and professional students in 1961 and Black undergraduates in 1963. In 1968, a major student protest known as the Vigil demanded pay increases and better treatment of hourly workers, most of whom were Black. In 1969, Black students protested in what is now known as the Allen Building Takeover, demanding improved services and treatment for Black students. The protest resulted in the formation of what is now called the Department of African and African American Studies.

Faculty at Duke produce influential scholarship across a wide range of disciplines and professions. Two Duke faculty members have received the Nobel Prize in Chemistry: Professor Robert Lefkowitz in 2012 and Professor Paul Modrich in 2015. Duke researchers have mapped the human chromosome and led research into the treatment of HIV and AIDS. Duke faculty also research pressing social issues, producing high-impact scholarship on such topics as election districting and public health. Faculty authors have written books of award-winning nonfiction, fiction, and poetry, and have won awards ranging from the National Book Award to the Pulitzer Prize. Fifty Duke faculty are members of the American Academy of Arts and Sciences. Duke students have many opportunities to work with leading faculty in labs and on projects, ensuring hands-on experience during their course of study.

Duke has a number of notable athletic achievements. Best known is the men’s basketball team, coached by Mike Krzyzewski from 1980 to 2022. The team has earned 5 national championships. The women’s golf team holds the record at Duke for most national championships, at 7. Duke football has been played since the 1880s, when President Crowell coached the team himself. During the 1930s and 1940s, the football team competed in and won a number of bowl games, earning the nickname “Iron Dukes.” The Rose Bowl game of 1942 was played in Durham due to wartime concerns on the West Coast and remains the only Rose Bowl played outside of Pasadena, California.
International programs have expanded over the last several decades, bringing international students to Duke in Durham and expanding international opportunities for Duke students. In 2005, Duke partnered with the National University of Singapore and opened the Duke-NUS Medical School. In 2014, graduate programs at Duke Kunshan University began, followed by undergraduate programs in 2018. DKU is a partnership between Duke and Wuhan University in Kunshan, China.

The university has changed in many ways since its founding, and like other historically white schools it continues to confront issues of racism, sexism, and other inclusion and equity challenges. Students of color and international students now represent more than 50% of the student body. Duke’s hometown of Durham has also grown and changed, and Duke and Durham collaborate on topics ranging from community service to downtown development.

Ever evolving, Duke University strives to meet the stated aims of the university: “to foster a lively relationship between knowledge and faith; to advance learning in all lines of truth; to defend scholarship against all false notions and ideals; to develop a love of freedom and truth; to promote a respectful spirit of dialogue and understanding; to discourage all partisan and sectarian strife; and to further the advancement of knowledge in service to society.”
Leadership
Full leadership profiles for those listed below are available at duke.edu/about/leadership.

Executive Leadership
Vincent Price, PhD, President | president.duke.edu
Daniel Ennis, MBA, MPA, Executive Vice President
A. Eugene Washington, MD, Chancellor for Health Affairs, Duke University, President and CEO, DUHS
Sally Kornbluth, PhD, Provost

Academic Leadership
Deans of Schools and Colleges
Kerry Abrams, James B. Duke and Benjamin N. Duke Dean of the School of Law
William Boulding, Dean, Fuqua School of Business
Edgardo Colón-Emeric, Dean, Divinity School
Vincent Guilamo-Ramos, Dean, School of Nursing and Vice Chancellor for Nursing Affairs
Judith Kelley, Dean, Sanford School of Public Policy
Mary E. Klotman, Dean, School of Medicine
Jerome P. Lynch, Dean, Pratt School of Engineering
Mohamed Noor, Interim Dean of Trinity College of Arts and Sciences
Toddi Steelman, Stanback Dean, Nicholas School of the Environment

Vice Provosts
Edward Balleisen, PhD, Vice Provost for Interdisciplinary Studies
Abbas Benmamoun, PhD, Vice Provost for Faculty Advancement
Gary Bennett, PhD, Vice Provost for Undergraduate Education
John Brown, Vice Provost for the Arts
Jennifer Francis, PhD, Executive Vice Provost
Dracine Hodges, Interim University Librarian
Mary Pat McMahon, Vice Provost/Vice President of Student Affairs
James S. Roberts, Vice Provost

University Administration
Pamela J. Bernard, Vice President and General Counsel
Maggie Epps, Secretary to the Board of Trustees and Chief of Staff to the President
Tracy Futhey, Vice President for Information Technology and Chief Information Officer
Leigh P. Goller, Chief Audit, Risk and Compliance Officer
Kimberly Hewitt, Vice President for Institutional Equity and Chief Diversity Officer
David L. Kennedy, Vice President for Alumni Engagement and Development
Nina E. King, Vice President and Director of Athletics
Jennifer Lodge, PhD, Vice President for Research & Innovation
Antwan Lofton, Vice President for Human Resources
John J. Noonan, Vice President for Facilities
Rachel Satterfield, Vice President for Finance
Michael J. Schoenfeld, Vice President for Public Affairs & Government Relations and Chief Communications Officer
Russell Thompson, Vice President for Operations
The Faculty

Duke faculty are chosen from among the most competitive selection processes in the country, having demonstrated excellence in their fields of research. Duke currently has two Nobel Laureates among its faculty. Many others hold appointments in the National Academy of Sciences. Their books and publications are numerous and influential.

Duke professors are also excellent teachers. There is an 8-to-1 ratio of students to faculty. Professors are committed to giving students the individual attention that pushes them to excel while nurturing their ideas. Undergraduates, even in their first year, interact with senior faculty on a regular basis in efforts such as the Focus Program, a series of first-year interdisciplinary seminars focused on a theme. In addition, many serve as advisors to students, including those who choose to design their program of study and as mentors to undergraduates who pursue hands-on research.

Profiles of Duke's faculty members are available via Scholars@Duke.
Assessment and Accreditation

Assessment

Academic and programmatic assessment at Duke are central to our institutional mission to provide the highest quality education possible. Assessment efforts include evaluating institutional effectiveness, program quality, faculty quality, and student educational outcomes. To be effective evaluators of our programs, we have developed an assessment relevant to each criteria that includes establishing program goals, setting achievement targets, identifying metrics, establishing data capture regimes, communicating findings to decision makers, documenting data-driven actions taken for program improvement, and adapting program metrics to capture the effects of the new initiatives.

Academic assessment is conducted at the program and the school level. The School Assessment Representatives Group coordinates each school’s academic assessment and shares best practices between the schools. The provost-appointed Committee for Assessment of Educational and Administrative Support oversees and provides feedback on assessment of administrative and academic services.

Accreditation

Duke University is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award baccalaureate, masters, doctorate, and professional degrees. Contact the Commission on Colleges at (404) 679-4500 for questions about the accreditation of Duke University.

Reaffirmation of accreditation occurs every ten years, with a five year interim review including a report on the progress of the Quality Enhancement Plan. General information on the overall process may be found in the SACSCOC Handbook for Reaffirmation of Accreditation.

Duke’s last reaffirmation of accreditation was conducted in 2019.

In addition to the decennial and mid-point reviews, Duke maintains compliance with policies defined and enforced by SACSCOC. Some of these policies require periodic reporting to our accreditor. The most common policy for which we have to report is Substantive Change.
Duke Community Standard

Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and nonacademic endeavors, and to protect and promote a culture of integrity.

To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors; and
- I will act if the Standard is compromised.

Students’ Obligation to Act with Respect to the Duke Community Standard

The Duke Community Standard (DCS) stresses the commitment that students share with all members of the community to enhance the climate for honesty, fairness, respect, and accountability at Duke University. Students affirm their commitment to foster this climate by signing a pledge that includes taking constructive action if they witness or know about behavior they perceive to be inconsistent with the DCS, which may include violation of university policies. Although there are no disciplinary sanctions associated with the failure to act, students are nonetheless expected to take action to do something as a responsibility of membership in the Duke community.

The university recognizes that it is not always easy to act in these situations, but several alternatives are available to suit a student’s level of comfort and confidence. These alternatives are not mutually exclusive.

- Speaking directly with the individual exhibiting the behavior, both to gain clarity about the situation and to inform the individual about the concern.
- Publicly calling attention to the behavior as it is occurring.
- For incidents involving social behaviors, alerting residence hall, Student Affairs, or other university staff. The information provided will give staff an opportunity to address the matter informally or through appropriate formal channels.
- For cases involving academic integrity, alerting the instructor that cheating may be occurring in the course. This alert can be in any form, including anonymous notification, and the reporting student will not be identified. The information provided will allow the faculty member to consider corrective measures, in consultation with the Office of Student Conduct and Community Standards, and to address the topic with the class or suspected student(s).
- Directly alerting staff in the Office of Student Conduct and Community Standards at (919) 684-6938 or conduct@duke.edu, who will confer with the faculty member involved, if an academic issue, or with the reporting student(s), strategizing next steps. Maintaining the confidentiality of the source is possible, but may limit the extent of action that can be taken.

The Context of the Duke Community Standard

The honor code at Duke is named the community standard because community is at the center of our conception of what it means to act honorably. Community entails a sense of connectedness to others and their welfare, feeling part of Duke University every day and being responsible for its continual improvement. Community refers as well to a feeling of connection to the city in which we are located. It posits the counterbalancing of group benefit with individual needs and wants, and a Duke identity with the many personal identities based on demographics and interest. The kind of environment we strive to achieve is one in which civility (but not docility) reigns; an environment in which ideas are promulgated, and challenged, in a stimulating give and take; an environment in which learning (whether from peers, faculty, administrators, or others in the Duke and broader communities) is accomplished with openness, honesty, and respect.

Citizens of the Duke community commit to acting with purpose, civility, and intention, both with personal decision-making and with interactions with each member of this community. Choosing to be a citizen of the Duke community means acknowledging the value of each member, participating in active reflection and asking the question, “How do my actions impact others?”

The honor code at Duke is named the community standard because it expresses our institution’s core values and a concomitant set of expectations for behavior. Because behavior is derivative of fundamental values, the standard applies off campus as well as on. The principles it articulates, while lofty in one sense, are firmly grounded in individual decisions made on the ground every day about every aspect of undergraduate life, in academic and co-curricular activities alike: in the classroom, residence halls, K-ville, off-campus apartment complexes, Myrtle Beach, Paris, and wherever else students may go. In addition, the standard asks that students not only reflect on their own behavior, as important as that is, but that they also act to encourage the integrity of their peers. By inspiring and supporting each other, students can shape their environment so that it reflects the ideals expressed in the Duke Community Standard.
The Standard, therefore, expresses our goals for undergraduate education in the broadest sense and is foundational to undergraduate life at Duke. It is followed by an equally important pledge that students sign as members of the community.

Duke University seeks to engage all students in its tradition of honor, a tradition that defines the institution and helps to guide students during their college careers and beyond. The students here today, who are the beneficiaries of the efforts of those who preceded them, have an extraordinarily important role to play in perpetuating and strengthening this tradition. We welcome, and count on, your involvement.

The History of the Duke Community Standard

In 1999-2000, Duke participated in a national survey through the Center for Academic Integrity. Through responses from undergraduate students, as well as from faculty and staff, the survey assessed the climate of academic integrity at Duke in comparative context with other institutions. As a result of the findings, the provost formed the Academic Integrity Council (AIC) in 2001 by appointing representatives from across the community whose charge was to review academic integrity policies and practices and make recommendations to improve the climate of integrity on campus.

An early goal of the AIC was to review the existing Honor Code, which had been in effect for the undergraduate community since 1993. The AIC determined that the Honor Code needed revision to make it shorter while embracing all aspects of a student's life at Duke. A major element of the revision was the inclusion of the fundamental values that must inform the definition of a community of honor.

This Duke Community Standard was proposed to the faculty councils of Trinity College of Arts and Sciences and the Pratt School of Engineering, as well as to the Duke Student Government. It was approved for the undergraduate community and implemented in the fall of 2003. The Standard was also incorporated into the code of each graduate and professional school of the university and, thus, represents the values we uphold as an institution.

Duke University is committed to ongoing evaluation of principles, policies, and practices, and to lively conversation about issues of integrity. Thus, Duke participated again in a national survey on academic integrity in the fall of 2005 and in intensive discussions of academic and social integrity from summer 2006 through spring 2007. The result of these continuing and broadened discussions was a revised Community Standard, put before the undergraduate student body in a student government referendum of April 2007 and overwhelmingly approved. Implemented in summer 2007, the new Duke Community Standard differs from its predecessor chiefly in its level of commitment to taking action (see Students Obligation to Act with Respect to the Duke Community Standard above).

In the spring of 2011, Duke University again surveyed undergraduate students about integrity, this time expanding beyond an academic focus to additional questions about integrity in other domains (i.e., social, work, and civic) inside and outside the classroom. In-depth focus interviews were also conducted with a sample of graduating seniors. Results showed a marked reduction in academic dishonesty in three key areas that were identified as problem areas in the 2005 survey: fabricating or falsifying a bibliography, falsifying or fabricating lab data, and copying or paraphrasing a few sentences without appropriate attribution. One area of concern that emerged from the 2011 survey was an increase in reported unauthorized collaboration. There was also a gap between students’ perceptions of the prevalence of dishonesty across these multiple domains and student self-reported rates of engaging in dishonest acts within these domains. Duke University will continue efforts to narrow students’ perception of the frequency of academic dishonesty and actual self-reported rates of cheating and other dishonest acts.

A Statement of Principles

The Duke Community Standard expresses a standard for behavior a set of expectations of students who claim membership in Duke's learning community. All incoming undergraduates, upon admittance to Duke, are required to sign a pledge to adhere to these values and to conduct themselves in accordance with these values throughout their undergraduate careers. Likewise, upon completion of each academic assignment, students may be asked to reaffirm their commitment to the Duke Community Standard by signing a statement indicating that they have adhered to the Duke Community Standard in completing the assignment.

The Duke Community Standard, thus, is a statement of principles. The specific policies, or rules and regulations of the university, define the conduct for which students can be held accountable.

University Regulations and the Disciplinary Process

Duke University has high expectations for students’ scholarship and conduct. Each student is subject to the rules and regulations of the university currently in effect, or which are put into effect from time to time by the appropriate authorities of the university. At the same time, the individual is responsible for decisions and choices within the framework of the regulations of the community, as Duke does not assume in loco parentis relationships.
Students, in accepting admission, indicate their willingness to subscribe to and be governed by these rules and regulations. They acknowledge the right of the university to take disciplinary action, including suspension or expulsion, for failure to abide by the regulations or for other conduct determined unsatisfactory or detrimental to the university community.

Responsibility for prescribing and enforcing rules and regulations governing student conduct rests ultimately with the Board of Trustees of Duke University and, by delegation, with administrative officers of the university. In the undergraduate schools, and in the university as a whole, many of these rules have been established over the years by cooperative action between students, faculty, and administrative officers. Representative student organizations, such as student governments and conduct boards, and more recently, community-wide bodies of students, faculty, and administrators, have initiated proposals for policies and rules necessary to assure satisfactory standards in academic and nonacademic conduct. These proposals have been accepted by university officers and have become a substantial, if not all-inclusive, body of rules governing student life at Duke. For current regulations, refer to the The Duke Community Standard in Practice: A Guide for Students.
Duke University Policy and Procedures under FERPA

Duke University adheres to a policy of compliance with the Family Educational Rights and Privacy Act. The policy (1) permits students to inspect their education records, (2) limits disclosure to others of personally identifiable information from education records without students' prior written consent, and (3) provides students the opportunity to seek correction of their education records where appropriate.

Definitions

Student. An individual who is, or who has become, in attendance at Duke University. It does not include an individual who was an unsuccessful applicant for admission to the University. A student definition also includes alumni/former students.

In Attendance. A student in attendance can be participating in person or by paper correspondence, video conference, satellite, Internet, or other electronic information and telecommunications technologies for students not physically present in a classroom. Attendance could also be the period in which a person is working in a work-study program. Duke University defines attendance to begin the first day a student arrives on campus for an official, organized campus activity (e.g. orientation, athletic practice, class, etc.) or participates in any official, organized activity offered by technology (e.g. orientation, class, etc.).

Education Records. Education records include those records that are personally identifiable and which are maintained by the University or a University official. Records could be information or data recorded in any medium, including but not limited to photos, handwriting, print, tapes, film, microfilm, and microfiche. Appendix A lists commonly held records by Duke University offices. Any University office or official may have an education record about a student, including offices not listed in the appendix. The following are not considered education records:

- Records about students made by professors and administrators for their own use and not shown to others.
- Campus police records maintained solely for law enforcement purposes and kept separate from the education records described above.
- Employment records, except where a currently-enrolled student is employed as a result of his or her status as a student (i.e. work-study).
- Records of a physician, psychologist, or other recognized professional or paraprofessional made or used only for treatment purposes and available only to persons providing treatment. However, these records may be reviewed by an appropriate professional of the student's choice.
- Records which contain only information relating to a person's activities after that person is no longer a student at the University.
- Application for admissions records to a Duke University school or program in which the student is not currently in attendance.

Personally Identifiable. Data or information that contains the name of a student; the student's parent or other family member's name; the address of the student, parent, or family member; a personal identifier, such as the social security number or student ID number; other information which would make the student's identity easily traceable.

Directory Information. The following categories of information have been designated directory information at Duke University:

- Name(s)
- Addresses
- Duke Unique ID
- Telephone listing(s)
- Email Addresses
- Place of birth
- Photograph(s)
- Major fields of study
- Participation in officially recognized activities and sports
- Weight and height of members of athletic teams
- Dates of attendance
- Enrollment Status (full/part time)
- Degrees and awards received
- Most recent previous educational institution attended

The University will give annual public notice to students of the categories of information designated as directory information and will allow a reasonable period of time after such notice for the student to inform the University that he/she wishes to suppress the
information from being disclosed. Directory information may appear in public documents and may otherwise be disclosed without student consent unless the student objects as indicated.

**Disclosure.** Permitting of access or the release, transfer, or other communication of education records orally or in writing, or by electronic means, or by any other means to any party.

**School Official.** A person employed by the University in an administrative, supervisory, academic, research, or support staff position, including public safety and health care personnel; a person or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees or a student serving on an official committee or assisting another school official in performing his or her tasks. School officials may only access and use education records as necessary to conduct official University business or for which they have legitimate educational interest.

**Legitimate Educational Interest.** An interest in reviewing student education records for the purpose of performing an appropriate University research, educational, or administrative function. A school official has legitimate educational interest if the need to see an education record is necessary in order to perform his or her professional responsibilities. Interests essential to the general process of higher education, including teaching, research, public service, and directly supportive activities such as academic advising, general counseling, therapeutic counseling, discipline, vocational counseling and job placement, financial assistance and advisement, medical services, academic assistance activities, and co-curricular activities including varsity and intramural sports, social fraternities, specific interest clubs, and student government.

**Right to Inspect Records**

Each student has a right of access to his or her education records, with the following exceptions:

- Financial records of the student's parents.
- Confidential letters and confidential statements of recommendation placed in education records of students before January 1, 1975, provided that the letters and statements were used only for the purposes for which they were intended.
- Confidential letters of recommendation and confidential statements of recommendation which were placed in the education records of the student after January 1, 1975, in connection with admission to an institution, an application for employment, or the receipt of an honor or honorary recognition, provided that the student has waived his or her right to inspect and review those letters and statements of recommendation.
  - Persons applying for admission may waive in writing their right to inspect and review confidential letters of recommendation and confidential statements of recommendation. The waiver may apply to confidential letters and statements only if the applicant or student is, upon request, notified of the names of all individuals providing the letters or statements, and such letters and statements are used solely for the purpose for which they were originally intended. The University will not require such waivers as a condition for admission or receipt of any service or benefit normally provided to students. A waiver may be revoked in writing at any time, and the revocation will apply to all subsequent recommendations.
- Education records of other students, if included on the education record of the student. The student may only inspect his/her own information.

Students wishing to review their records should submit a written request to the Office of the University Registrar, 1121 West Main Street, Suite 1200, Durham, NC 27701, or registrar@duke.edu. The request should include the following: full name, Duke student ID or Unique ID, records requested to be reviewed, purpose of review, admit term(s), Duke school/program(s), phone, and home and local addresses. The University will comply with record review requests within 45 days.

For students living locally (within commuting distance of approximately 50 miles), arrangements will be made for the student to read his or her records in the presence of a staff member. Copies are not provided, including copies of transcripts from other institutions. Other arrangements will be made for students not living locally.

A student who exercises the right to review his/her education record is also entitled to a reasonable request for explanation and interpretation of those records. If a student has made the request to review his/her record, none of those records shall be destroyed until the student's request to inspect or review has been honored.

**The Provision of Academic Information to Parents and Guardians**

Duke University complies with the policies set forth in the Family Educational Rights and Privacy act of 1974 concerning confidentiality, privacy, and release of information as they pertain to students’ educational records. It is primarily the responsibility of students to keep parents and guardians informed of their academic standing and progress as well as any difficulties which may affect their performance. The Office of the University Registrar does not release end-of-term or midterm grade information to parents and guardians without
students’ written permission. Suppose a student’s academic standing at the university changes, the Office of the Dean may notify parents and guardians in writing. Parents and guardians may also be alerted to the emergency and extraordinary situations which may impinge upon a student’s well-being.

Disclosure of Personally Identifiable Information

The University will not release personally identifiable information in education records or allow access to those records without prior consent of the student, other than information deemed “directory information.” Unless disclosure is to the student himself or herself, the consent must be written, signed and dated, and must specify the records to be disclosed and the identity of the recipient. Prior consent may not be required for disclosure of education records to the following:

- School officials of Duke University who have been determined to have legitimate educational interests.
- Officials of other schools in which a student seeks or intends to enroll or is enrolled. Authorized representative of the Comptroller General of the U.S., the Attorney General of the U.S., the U.S. Secretary of Education, and state and local educational authorities, but only in connection with the audit or evaluation of federally supported educational programs, or in connection with the enforcement of, or compliance with, federal legal requirements relating to these programs. These officials will protect information received so as not to permit personal identification of students to outsiders, and the data shall be destroyed when no longer needed for the purposes above.
- In connection with a student’s application for, or receipt of, financial aid, but only to the extent necessary for such purposes as determining eligibility, amount, conditions, and enforcement of terms or conditions.
- State and local officials to which such information is specifically required to be reported by effective state law.
- Organizations conducting educational studies for the purpose of developing, validating, or administering predictive tests, administering student aid programs, and improving instruction. The studies shall be conducted so as not to permit personal identification of students to anyone other than representatives of the organizations, and the information will be destroyed when no longer needed for these purposes.
- AccREDITING organizations for purposes necessary to carry out their functions.
- Parents of a student who is a dependent for income tax purposes (dependency must be documented).
- Appropriate parties in connection with an emergency, where knowledge of the information is necessary to protect the health or safety of the student or other individuals.
- In response to a court order or subpoena (The University will make reasonable efforts to notify the student before complying with the court order).
- A victim of an alleged perpetrator of a crime of violence or a non-forcible sex offense. This disclosure may only include the final results of the disciplinary proceeding with respect to that alleged crime or offense, regardless of the finding.
- On request, the final results of a disciplinary proceeding where a student has allegedly perpetrated a crime of violence or non-forcible sex offense and has been found to have violated University rules or policies. The names of the victims, witnesses, or other students will not be disclosed without consent.
- Parents of a student under the age of 21 who has been found with an alcohol-related disciplinary violation.

It is Duke University’s practice not to provide student education record information to any party outside the institution with the exception of vendors contracted to provide a service to the institution and are considered school officials and a few entities that provide support for major Duke University events, such as commencement.

The University will maintain with the student’s education records a record for each request and each disclosure, except:

- disclosures to the student himself or herself;
- disclosures pursuant to the written consent of the student;
- disclosures to instructional or administrative officials of Duke University;
- disclosures of directory information;
- disclosures pursuant to a Federal grand jury’s subpoena or other law enforcement subpoenas where the court or other agency issuing the subpoena has ordered the institution to not disclose the existence of the subpoena.

The record of disclosure may be inspected by the student, the official custodian of the records, and other University and governmental officials.

A student wishing to suppress the release of “Directory Information” may do so by completing the Request for Non-Disclosure form. The form may be obtained by contacting the Office of the University Registrar at registrar@duke.edu. The student should weigh the implication of placing the suppression. By withholding the release of “Directory Information” Duke University will:
Duke University

- not include the student's name, address, email address, or phone number in the student directory;
- refuse to release any information about the student to the student's insurance company, current or future employers, all forms of media, and any non-institutional persons or organizations;
- give no personal information over the phone;
- will state "do not have any documentation that would support the release of information for a student by that name" to any person/organization/company that would seek information about a student's status.

The Request for Non-Disclosure does not prevent the disclosure of information to University personnel with a legitimate educational interest.

The Request for Non-Disclosure remains in effect until the student rescinds the request. A student who wishes to revoke a Request for Non-Disclosure must complete the Request for Revocation of Non-Disclosure of Directory Information form. A request in place at the time of graduation or at the time of leaving Duke University remains in effect in perpetuity.

**Right to Seek Correction of Records**

A student who believes that information contained in his or her education records is incorrect, misleading, or violative of privacy or other rights may submit a written request to the Office of the University Registrar, specifying the document(s) being challenged and the basis for the complaint. The request will be sent to the custodian of the record in question. Within a reasonable period of time of receipt of the request, the University will decide whether to amend the records in accordance with the request. If the decision is to refuse to amend, the student will be so notified and will be advised of the right to a hearing.

A student request for a formal hearing must be made within 30 calendar days after the student receives notice from the record custodian that the record(s) will not be amended. The request for hearing must be made in writing to the Office of the University Registrar, signed by the student, and contain: 1) a statement that the student is requesting a formal hearing on a request to amend a record, 2) the date the student received notice from the record custodian, and the name of the record custodian, that the record would not be amended, 3) a summary of the attempts to resolve the matter with the records custodian and the result of those attempts, and 4) a summary of the evidence and arguments the student would present at a hearing.

A hearing will be held within 30 calendar days after the receipt of the student's request, and the student will be given ample advance notice of the date, place, and time of the hearing.

**Conduct of the Hearing.** The hearing will be conducted by a University official who does not have a direct interest in the outcome. The student will have a full and fair opportunity to present evidence relevant to the issues raised and may be assisted or represented by individuals of his or her choice at his or her own expense, including an attorney. The University official conducting the hearing will, after considering all relevant information, make a recommendation to the University Registrar.

**Decision of the Hearing.** Within a reasonable period of time after the conclusion of the hearing, the University will notify the student in writing of the decision. The decision will be based solely upon evidence presented at the hearing and will include a summary of the evidence and the reasons for the decision.

If the University decides that the information in the student's records is inaccurate, misleading, or otherwise in violation of the privacy or other rights of the student, the University will amend the record(s) accordingly.

If, as a result of the hearing, the University decides that the information is not inaccurate, misleading, or violative of the student's right, the student has the right to place, in his or her record, a statement commenting on the information and/or explaining any reasons for disagreeing with the University's decision. Any such explanation will be kept as part of the student's record as long as the contested portion of the record is kept and will be disclosed whenever the contested portion of the record is disclosed.

**Limit to FERPA Protection of Records**

FERPA's protection of personally identifiable information in a student's education record ends at the time of death.

**Complaints**

Complaints alleging violation of the provisions of FERPA may be submitted to:

Family Policy and Compliance Office
US Department of Education
400 Maryland Avenue SW
Washington, DC 20202-5920
1-800-872-5327
Duke University

Duke’s Commitment to Diversity and Inclusion
Duke aspires to create a community built on collaboration, innovation, creativity, and belonging. Our collective success depends on the robust exchange of ideas—an exchange that is best when the rich diversity of our perspectives, backgrounds, and experiences flourishes. To achieve this exchange, it is essential that all members of the community feel secure and welcome, that the contributions of all individuals are respected, and that all voices are heard. All members of our community have a responsibility to uphold these values.

Excellence, Diversity, and Inclusion: A statement by the faculty, Provost, and President
To achieve our mission and meet the needs of a rapidly changing world, Duke strives to create a climate of collaboration, creativity, and innovation within and across disciplines. Our success depends upon the robust exchange of ideas—an exchange that flourishes best when the rich diversity of human knowledge, perspectives, and experiences is heard. We nonetheless acknowledge that our policies and practices have often failed to ensure equality of participation within our community. Our renewed commitment and responsibility to one another is articulated in the following statement.

Duke University Community Commitment
Because diversity is essential to fulfilling the university’s mission, Duke is committed to building an inclusive and diverse university community. Every student, faculty, and staff member—whatever their race, gender, age, ethnicity, cultural heritage or nationality; religious or political beliefs; sexual orientation or gender identity; or socioeconomic, veteran or ability status—has the right to inclusion, respect, agency and voice in the Duke community. Further, all members of the University community have a responsibility to uphold these values and actively foster full participation in university life.
Credit Hour Policy

For purposes of the application of this policy and accord with federal regulations,

1. A semester-course unit is the equivalent of four credit hours.
2. A "contact hour" is defined as a required time in which all students are directly engaged, as a class, in interaction with the instructor(s) of the course, synchronously or asynchronously, either in the classroom or virtually through telepresence, web-conference, or other online platforms.
3. A credit hour is expected to be a reasonable approximation of a minimum amount of student work in a Carnegie unit in accordance with commonly accepted practice in higher education.

University and Divinity Courses

Beginning Fall 1969, credit for Trinity undergraduates, Pratt undergraduates, and the Divinity School has been listed in semester-course units. One semester-course unit is equivalent to four semester hours.

1. A single semester-course unit should require a minimum of 12 hours per week of a student's time and effort, both in and outside of class, over a 15-week term, or 25 hours per week over a 7-week term.
2. All full-credit courses require a minimum number of "contact hours" totaling 150 minutes per week over 15 weeks, or 300 minutes per week over 7 weeks.

Graduate and Professional School Courses

The Graduate and Professional Schools list credit in semester hours. It is expected that the academic work required of Graduate and Professional school students will be the equivalent of:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out of 15 weeks for one semester hour of credit, or the equivalent amount of work over a different amount of time, or
2. At least an equivalent amount of work as required outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

All Courses

1. When a course is offered at two levels (e.g., undergraduate and graduate), workload expectations will differ for the students enrolled at different levels.
2. Instructional units should periodically review course syllabi to determine whether the number of course units/credits is appropriate for the expected student workload.
Student Affairs & Campus Life

Student Affairs
The Division of Student Affairs is critically engaged in all aspects of undergraduate and graduate students’ lives and collaborates with students, faculty, staff, alumni, parents, and many others to deliver key services and support to students and all whom the division serves.

Student Affairs provides programs and services that support the optimal growth of Duke students; enhance their intellectual, social, cultural, and physical development; and complement Duke’s academic excellence by providing opportunities for students to experience education and explore interests beyond the classroom. For more information, visit studentaffairs.duke.edu.

Campus Life
Campus Life (studentaffairs.duke.edu/campuslife) provides education, advocacy, and support for Duke students through advising, leadership development, and experiential education. Campus Life consists of departments that work with the campus community to promote intellectual understanding, acknowledgement, and appreciation of their differences and similarities; advocate for equal access for students and student groups to participate in campus activities, including an equitable distribution of support resources for those activities; and promote a seamless integration of the academic and cocurricular sides of the university to promote a holistic, educational experience for students.

Outreach programs and services are designed to foster an equitable and engaged university community as well as a culture of broad social and civic understanding.

Campus Life Departments
Find more information about all Campus Life departments at studentaffairs.duke.edu/campuslife/campus-life-departments.

The Center for Sexual and Gender Diversity (CSGD) provides education, advocacy, support, mentoring, academic engagement, and space for lesbian, gay, bisexual, pansexual, transgender, transsexual, intersex, questioning, queer and allied students, staff, and faculty at Duke. The Center for Sexual and Gender Diversity also serves and supports Duke alumni/ae and the greater LGBTQ community.

The Center for Multicultural Affairs (CMA) offers educationally based cross-cultural programs and providing technical support on multicultural issues for the university community.

International House provides educational services, advocacy, and outreach to the international population and the Duke/Durham community.

Jewish Life at Duke works to foster and enrich Jewish life through social, educational, religious and cultural activities.

The Mary Lou Williams Center for Black Culture strives to promote racial understanding, build community, and foster an appreciation for and increase knowledge of Black people, Black history, Black culture, and the vast contributions of people of the African Diaspora.

Muslim Life at Duke is committed to enriching the lives of Muslim students and the whole campus through organizing events and activities that cater to the spiritual, social and intellectual needs of Duke students.

The University Center Activities and Events (UCAE) provides services, support, and opportunities for students to create and engage in co-curricular experiences that result in personal development, transferable skills, and meaningful connections. UCAE also provide event management expertise for groups of all sizes interested in holding events at Duke.

Women’s Center is dedicated to helping every woman at Duke become self-assured with a kind of streetwise savvy that comes from actively engaging with the world. It welcomes men and women alike who are committed to gender equity and social change.

Graduate and Professional Student Government
The Graduate and Professional Student Government of Duke University (GPSG) is the umbrella student government organization for Duke’s nine graduate and professional schools. Their purpose is to: represent and advocate on behalf of graduate and professional students at Duke University; serve as a liaison among the student governments of the graduate and professional schools of the University; serve as a liaison between graduate and professional students and the University Administration; nominate graduate and professional student representatives to University committees; program events of interest to the graduate and professional student community; and financially support the programming of graduate and professional student groups.
Visit the GPSG website at gpsg.duke.edu to find out more about graduate and professional student organizations at Duke and for information on upcoming events. Contact GPSG (gpsgexec@duke.edu) for additional details on how students can become involved.

**The Black Graduate and Professional Student Association**

The Black Graduate and Professional Student Association (BGPSA) represents all minority graduate and professional students on the Duke University campus. The association’s primary mission is to enhance the Duke experience for its members through community service, social, and academically based programming events. As an umbrella organization, the association welcomes students from groups including the Black & Latino MBA Organization, Black Law Students Association, Black Seminarians Union, Bouchet Society, Hurston-James Society, and Student National Medical Association. Through its academic forums, luncheons, community service initiatives, social events, and recognition ceremony the group hopes to assist in the development of future minority leadership in the Duke community and in the world.

**Religious Life**

In partnership with the Division of Student Affairs, the Chapel convenes, supports, and advocates for all of the officially recognized Religious Life groups on campus that serve students, including Buddhist, Catholic, Hindu, Jewish, Latter-Day Saints, Muslim, Orthodox, and Protestant organizations and groups. There are about two dozen Religious Life groups at Duke; find a listing of them at chapel.duke.edu/religiouslife.

With a mission of “bridging faith and learning,” the Chapel holds ceremonies, concerts, Christian worship services, and more. It is a sanctuary open to all people for important personal moments of prayer, reflection, grief, and gratitude. The Chapel’s Student Ministries provides opportunities for undergraduate students to hear and respond to God’s call for their lives on campus, in Durham, and beyond through study, artistic expression, counsel, service, and community. Learn more at chapel.duke.edu.

**Intercollegiate Athletics**

The Athletic Department fosters intercollegiate athletics by striving for excellence and by providing the best possible framework within which highly accomplished student-athletes can compete. The department has a dual responsibility to provide a high-quality athletic program and environment so that all students have the opportunity to compete to the fullest extent of their abilities. Duke is a member of the National Collegiate Athletic Association (NCAA) and the Atlantic Coast Conference (ACC).

First-year students may participate on all varsity teams. The director of athletics provides departmental leadership and coordinates all athletic policies with the University Athletic Council. The council consists of representatives from the undergraduate student body, the faculty, the administrative staff, the trustees, and the alumni. The council meets with the director of athletics periodically during the school year.
Student Health & Safety

Campus Police
It is the mission of the Duke University Police Department to protect and serve the people and property of Duke. We are guardians of a community of world class education, research and healthcare and must prevent violence, reduce fear, and build relationships. For more information, visit police.duke.edu.

Counseling & Psychological Services (CAPS)
CAPS helps Duke students enhance their strengths and learn to cope with the trials of living, growing, and learning. CAPS offers many services to Duke undergraduate, graduate, and professional students, including brief individual counseling/psychotherapy, consultation, couples and group counseling, and assistance with referrals. CAPS' staff also provide outreach education programs to student communities, promoting an empathic and supportive culture. Staff members are available for consultation with faculty concerning students or other matters relating to mental health in the university community. The CAPS staff includes psychologists, clinical social workers, and psychiatrists experienced in working with college-age adults. CAPS' staff carefully adhere to professional standards of ethics, privacy, and confidentiality. For more information, visit studentaffairs.duke.edu/caps.

DukeReach
DukeReach provides direct case management services including interventions, advocacy, referrals and follow-up services for students who are experiencing significant difficulties related to mental health, physical health, and/or psycho-social adjustment. The Assistant and Associate Deans in DukeReach coordinate student services and provide connections with campus departments as well as outside agencies and providers. For more information, visit studentaffairs.duke.edu/dukereach.

DuWell
DuWell works to enhance the educational experience for Duke students by addressing substance use and abuse issues and promoting healthy physical, emotional and social development, including issues related to sexual health. It offers one-on-one screening (for substance use) and health coaching, workshops and trainings on the different topic areas of wellness (including Social Host Education, Stress and Sexual Health workshops) and programs for student groups upon request. Consultation on prevention of high-risk behavior and promotion of wellness is available to students, faculty, professionals and staff. DuWell is dedicated to fostering a living/learning environment on campus and within the surrounding community that encourages the full development of the individual as an engaged member of the community. For more information, visit studentaffairs.duke.edu/duwell.

Student Health
Student Health Services at Duke University is jointly supported by the Division of Student Affairs and the Department of Pediatrics. The Duke Student Health Center is the primary source for a wide range of healthcare services, many of which are covered by the Student Health Fee. Its mission is to provide evidence-based, patient-centered health care to the Duke student community in a professional and compassionate manner that directly contributes to the student's well-being and overall success. For more information, visit studentaffairs.duke.edu/studenthealth.
Housing, Dining, & Transportation

Housing and Residence Life (HRL)

Undergraduate Housing

Housing, Dining and Residence Life manages all aspects of the university’s three-year undergraduate residency requirement. Residential programs are designed to build positive communities that value learning, create new opportunities for faculty engagement, and generate positive social connections. HRL, student residents and others in the Duke community develop and maintain environments that support classroom learning and encourage students to seek learning opportunities in the world around them. HRL promotes opportunities for students to connect with others and develop a strong and enduring sense of belonging; and intentionally provide opportunities for students to grow and develop as they continue to negotiate developmental issues related to identity, autonomy, and responsibility. HRL programs are rooted in the concepts of mutual respect and civility, and recognize and celebrate the dignity and self-worth of all members.

HRL also manages the facilities operations of all university student residences, which comprise approximately 25 percent of all university space. These responsibilities include all long-range planning, renovations, and major projects, managing housekeeping and maintenance efforts, and ensuring that all residence options are safe, secure, comfortable, and well-maintained. For more information, visit studentaffairs.duke.edu/hdrl.

Graduate and Professional Student Apartments

Limited on-campus housing is available to full-time graduate students. Priority for housing assignment will be awarded to graduate students who arrive from abroad on student visa status and it is their first time attending school outside of their home country. Students applying for the full academic year will be given priority in assignment. All students applying for less than the full academic year will be assigned on a space-available basis after all students applying for the full academic year have been accommodated. International students do not receive priority when applying for less than the full academic year. For more information on graduate student housing application timeline and facility amenities, visit this website. Assignments are made in the order of receipt of completed applications.

Off-Campus Housing

The Duke Community Housing Office maintains a listing of rental apartments, rooms, and houses provided by property owners or real estate agencies in Durham at durhamgradhousing.com.

Duke Housing and Residence Life (HRL) operates a website specifically to simplify the off-campus housing search for students, parents, faculty and staff, and for area property owners and managers at nearduke.com/housing.

Duke Dining

Duke is home to one of the most innovative, dynamic, and cutting edge collegiate dining programs in the country. Duke Dining provides access to over 45 dining locations that include 36 on-campus locations, Merchants-on-Points (MOPs-off-campus restaurants that deliver), and food trucks. A community-driven, sustainable, award-winning program, Duke Dining provides opportunities for culinary education and engagement with access to cooking classes, chef demos, nutrition and wellness events and special themed dinners throughout the academic year. For more information, visit studentaffairs.duke.edu/dining.

DukeCard

All Duke students are issued electronic Duke University identification cards through their mobile devices. This identification should be carried at all times. DukeCards are the means of identification for library privileges, athletic events, and other university functions or services open to them as university students. Students will be expected to present their cards on request to any university official or employee. DukeCards are not transferable and fraudulent use may result in loss of student privileges or suspension. For more information, visit dukecard.duke.edu.

Parking & Transportation

Duke Parking & Transportation provides the Duke community with parking options that balance price and convenience while managing supply and demand across the parking system. A valid permit is required in all locations; most locations are gated and the permit activates the entry and exit gates. Visitors who do not have a permit pay by the hour in facilities specially set aside for them. Accommodations are also available for patrons that require accessible parking or transportation.

Options include annual permits and short-term permits that allow for flexible or occasional parking. Anyone affiliated with Duke is
eligible to purchase on-campus parking in available locations. There are also many transportation options available at Duke, including Duke Transit (buses), vans, city and regional buses, private taxi service, and a ride-hailing program. For more information, visit parking.duke.edu.
Student Disability Access Office (SDAO)

The Student Disability Access Office (SDAO) recognizes disability as an aspect of diversity that is integral to society and to our campus community. Accessibility is an essential feature of the Duke campus, and the SDAO strives to create an inclusive community for our students. The SDAO strives to ensure that students with disabilities are provided the tools they need to fully access all aspects of student life inside and outside of the classroom.

Core Functions of SDAO

- Partner with students with disabilities to establish services for their access and inclusion on campus
- Manage, coordinate, implement and evaluate accommodation/service programs
- Serve as a resource to students/faculty/staff to ensure effective provision of services
- Provide educational and resource support to the campus community to increase awareness regarding how to create and sustain access and inclusion for students with disabilities in all aspects of the university
- Provide resource and referral information to the campus community and prospective student and their families

SDAO works with each student individually to establish academic adjustments and auxiliary aids and services, more frequently referred to as academic accommodations for the purpose of eliminating the environmental barriers impacting the student’s equitable access to the campus facilities, programs and activities.

In order to receive consideration for reasonable accommodations under Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 (ADA), and the ADA Amendments Act of 2008, a student must have a physical or mental impairment that substantially limits one or more major life activities. Students requesting accommodations under the provisions of the ADA, ADA Amendments Act of 2008, and Section 504 of the Rehabilitation Act of 1973 (e.g., academic, accessibility, housing) must contact the Student Disability Access Office to explore possible coverage. Students with medical conditions not covered under the provisions of the ADA and the ADA Amendments Act may wish to contact Duke Student Health Service. Additional information and requests for accommodations may be found on the SDAO website.

For more information, visit access.duke.edu/students.
Continuing Studies

Academic Study

Admission to the Continuing Studies Program is discretionary. For consideration for admission, applicants to the Continuing Studies Program must meet at least one of the following two criteria.

- Earned bachelor’s degree from a college or university accredited by a national or regional accrediting body recognized by the Department of Education.
- Age 25 or older, and intend to initiate or complete academic study in a Duke University academic program.

Students are given academic counseling by the Office of Continuing Studies and Summer Session, and are subject the regulations set forth for degree candidates, unless explicitly noted otherwise. A junior or senior who is currently enrolled at an external college or university who wishes to pursue an academic discipline unique to Duke University, may apply through the Office of Continuing Studies for admission as a nondegree, full-time visiting student for one or two semesters. Students with unique circumstances should contact the Office of Continuing Studies.

Minimum GPA Requirement

Successful applicants are expected to have earned a minimum 3.0 GPA in their most recent program.

Applicants who fail to meet the minimum GPA requirement, are subject to additional review and may be admitted on a provisional basis. As part of the additional review, the following will be taken under consideration:

- the applicant has not been enrolled as a full-time student in the last 4 years, and
- the applicant demonstrates the ability to successfully complete college level coursework by earning a passing grade (B or better) in a minimum of 4 courses during the last 2 years.

As part of a provisional admission, a student must earn a minimum 3.0 GPA in the semester immediately following the provisional admission.

Withdrawal

If a student enrolled in a Duke University program withdraws from the program, or is no longer in good academic standing, they must wait two academic terms before re-applying to any Duke program, including Continuing Studies (see the Satisfactory Continuation Requirements outlined on page 51 of the Bulletin of Undergraduate Instruction).

Semester Continuation Requirements

Semester continuation requires that you earn a passing grade (C-or better) in a minimum number of courses to remain in good standing. Students who receive at least one failing grade (D, D-, F) are subject to academic probation or academic dismissal.

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<th>Academic Probation</th>
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<tr>
<td>- Earned D or D-in at least one course</td>
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<td>- Earned F in one course, and C-or better in at least two courses</td>
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<tr>
<th>Academic Dismissal</th>
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<tr>
<td>- Earned F in at least one course</td>
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Students placed on academic probation must acknowledge their probationary status in writing to the academic dean for Continuing Studies students, in order to continue into the next academic term. They are also expected to seek assistance from campus resources and have their course selection approved by their academic dean. In the probationary term they must earn grades of C or better in all courses to continue. Students who withdraw from all courses must wait two semesters to submit a request to return to study.

Program and application information is available from Duke Continuing Studies. Application deadlines: August 1 for the fall semester, December 1 for the spring semester, April 15 for Term 1 of the summer session, and June 1 for Term 2 of the summer session.

Certificate Programs

Professional certificate programs offered include human resource management, management accounting, digital media and marketing, big data and data science, technical communications, business communications, business ethics, paralegal studies, financial planning, event development, Six Sigma Green Belt, entrepreneurship, supply side management, sustainable management, online learning, finance essentials, legal nurse consulting, and others.
Nonprofit Management Program
Students interested in the nonprofit sector or in community development are invited to explore the noncredit course offerings of this program. Taught by experts and practitioners, these short courses offer instruction concerning financial and resource management, management of personnel and volunteers, leadership development, fundraising, planning and evaluation, board development/governance, and media relations.

Osher Lifelong Learning Institute (OLLI) at Duke
OLLI at Duke began in 1977 as the Duke Institute for Learning in Retirement. Since 2004 the membership organization has been a member of the Osher Lifelong Learning Network, a group of more than 120 institutes across the country dedicated to meeting the needs of older learners and extending the demographic served by traditional universities. OLLI sponsors noncredit course offerings in the fall, winter, and spring as well as fall and spring retreats, language tables, reading groups, film and lecture series, and volunteer opportunities.

Duke Youth Programs
For more than thirty-five years, Duke Youth Programs has offered academic enrichment opportunities for middle and high school students in the summer. Current offerings range from camps in biosciences and engineering, forensic science, game design, drones, math, cryptography, neurosciences, creative writing, SAT preparation, video production, and a college admissions boot camp. For more information, call the Office of Continuing Studies and Summer Session at (919) 684-6259, or visit learnmore.duke.edu.
Duke University Libraries

The Duke University Libraries are the shared center of the university's intellectual life. The William R. Perkins Library, Bostock Library and Rubenstein Rare Book & Manuscript Library comprise the main West Campus library complex, which is joined by Lilly and Music libraries on East Campus, the Perse Memorial Library at the Duke Marine Lab and the separately administered libraries serving the schools of Business, Divinity, Law and Medicine. Together they form one of the nation's top ten private university library systems.

All Libraries

Perkins & Bostock Libraries (library.duke.edu)
David M. Rubenstein Rare Book & Manuscript Library (library.duke.edu/rubenstein)
Duke University Archives (library.duke.edu/rubenstein/uarchives)
Lilly Library (library.duke.edu/lilly)
Music Library (library.duke.edu/music)
Marine Lab Library (library.duke.edu/marine)
Library Service Center (library.duke.edu/lsc)
Divinity School Library (library.divinity.duke.edu)
Duke Kunshan University Library (dukekunshan.edu.cn/en/academics/library)
Ford Library, Fuqua School of Business (library.fuqua.duke.edu)
Goodson Law Library (law.duke.edu/lib)
Medical Center Library (mclibrary.duke.edu)

University Institutes

Duke Institute for Brain Sciences (DIBS)

The Duke Institute for Brain Sciences (DIBS) provides a vibrant hub for all who share our vision of making neuroscience greater than the sum of its parts by integrating schools, disciplines, analysis and education to accelerate breakthroughs and benefit society. It is an exciting place to be! The DIBS mission is to promote interdisciplinary brain science and translate discoveries into solutions for health and society. Each year, DIBS touches thousands of people, from our 190-member Faculty Network and hundreds of students and trainees to the many who benefit from campus, community, and outreach activities. For more information, visit dibs.duke.edu.

Kenan Institute for Ethics

The Kenan Institute for Ethics is an interdisciplinary think and do tank committed to promoting moral reflection and commitment, conducting interdisciplinary research, and shaping policy and practice at Duke and beyond. From current policy debates about the ethics of migration, cyber-security, or artificial intelligence to historical interrogations of the rise of a post-secular society and nature of genocide to philosophical puzzles about the limits of individual responsibility or foundations of happiness, the Kenan Institute for Ethics takes seriously the notion that ethical questions and problems are indeed everywhere. For more information, visit kenan.ethics.duke.edu.

Duke Global Health Institute (DGHI)

Formed in 2006 as part of Duke University's commitment to spark innovation in global health research and education, the institute brings together knowledge and resources from across the university to address the most important global health issues of our time. DGHI faculty, staff and students are engaged in research and educational projects in more than 40 countries, including the United States. In several of these countries, DGHI has built longstanding, bilateral collaborations with local institutions and organizations, including Duke-affiliated partners such as Duke Kunshan University in China and the Duke-NUS Medical School in Singapore. For more information, visit globalhealth.duke.edu.

John Hope Franklin Humanities Institute (FHI)

Founded in 1999, the John Hope Franklin Humanities Institute (FHI) is built on a fundamentally collaborative model befitting the Duke University emphasis on knowledge in the service of society. Through interdisciplinary cross-fertilization, we seek to encourage the
conversations, partnerships, and collaborations that continually stimulate creative and fresh humanistic research, writing, teaching, and practice at Duke. Inspired by the scholarly and civic example of John Hope Franklin, we also support work that engages questions of race and social equity in their most profound historical and global dimensions. For more information, visit fhi.duke.edu.

The Social Science Research Institute (SSRI)
The Social Science Research Institute (SSRI) brings together researchers with interests in problems that cross the various social and behavioral sciences, including problems that connect with the humanities and natural sciences. It promotes multidisciplinary collaboration among such scholars as they work on important social issues that are challenging to address fully from within any given discipline. For more information, visit ssri.duke.edu.

The Nicholas Institute for Environmental Policy Solutions
The Nicholas Institute for Environmental Policy Solutions at Duke University improves environmental policymaking worldwide through objective, fact-based research to confront the climate crisis, clarify the economics of limiting carbon pollution, harness emerging environmental markets, put the value of nature’s benefits on the balance sheet, develop adaptive water management approaches, and identify other strategies to attain community resilience.

The Nicholas Institute is part of Duke University and its wider community of world-class scholars. This unique resource allows the Nicholas Institute’s team of economists, scientists, lawyers and policy experts to not only deliver timely, credible analyses to a wide variety of decision makers, but also to convene these decision makers to reach a shared understanding regarding this century’s most pressing environmental problems. For more information, visit nicholasinstitute.duke.edu.

Bass Connections
Bass Connections bridges the classroom and the world beyond the university, giving students from all of Duke’s schools a chance to tackle complex societal problems alongside our superb faculty. We support research teams that draw on perspectives and methods from multiple disciplines, as well as robust engagement with communities, stakeholders and decision-makers.

Named in honor of founding donors Anne T. and Robert M. Bass P’97, the program exemplifies Duke’s commitment to interdisciplinary, collaborative inquiry. The Basses’ $50 million gift sparked a new approach to integrating research, education and civic engagement within the university; by including a $25 million matching challenge, their donation has already inspired more than 65 donors to support this innovative program.

Through Bass Connections, Duke is channeling its unique culture of collaboration, ambitious entrepreneurial spirit and established record of applying classroom learning to pressing global problems, to create a distinctive new model for education. For more information, visit bassconnections.duke.edu.

Initiatives

Rhodes Information Initiative at Duke (iiD)
The Rhodes Information Initiative at Duke (iiD) is an interdisciplinary program designed to increase "big data" computational research and expand opportunities for student engagement in this rapidly growing field. Started in 2013, the program is led by Robert Calderbank.

Launched as an initiative of Duke University, Rhodes iiD is partnered with the Duke University Quantitative Initiative, which promotes cross-pollination of ideas throughout Duke’s programs and research projects, and works to increase the number of quantitative faculty in all disciplines on Duke campus. For more information, visit bigdata.duke.edu.

Innovation & Entrepreneurship Initiative (I&E)
I&E believes all Duke students benefit from learning about innovation and entrepreneurship—from those who wish to found a company, to those who want to change the world with innovation, to those who simply want to cultivate a more creative and entrepreneurial mindset.

I&E partners with schools and departments across Duke to offer interdisciplinary, experience-based education. Whether students are working on their own idea with a mentor, or advancing an exciting faculty innovation through a course, students learn via experiences that are in service of ambitious, worthy goals and offer opportunities for meaningful collaboration. For more information, visit entrepreneurship.duke.edu.
The Duke Initiative for Science & Society

The Duke Initiative for Science & Society ("Science & Society") fosters research, education, communication, democratic deliberation, and policy engagement on the ethical progress of science and technology in society. Science & Society takes an interdisciplinary approach, with a focus on applied ethics and policy, to advance the responsible use of science and technology for humanity. For more information, visit scienceandsociety.duke.edu.

MEDx

MEDx (Medicine + Engineering at Duke) was forged in 2015 to enhance existing ties and foster new interdisciplinary collaborations between the School of Medicine and Pratt School of Engineering as the first part of a Provost initiative to create opportunities at the intersection of academic units, Together Duke. An initiative rather than an institute, MEDx is structured to enhance existing ties and encourage new collaborations among faculty from both schools as well as other schools, institutes and initiatives at Duke.

MEDx fosters the exchange of ideas and creates research opportunities between physicians, engineers, computer scientists, researchers and innovators. We promote the training of the next generation of researchers and clinicians to work symbiotically on new solutions to complex clinical problems, and we develop strategic commercialization opportunities to translate research advances into effective devices, therapeutics and care delivery systems. For more information, visit medx.duke.edu.

Centers

Margolis Center for Health Policy

The Robert J. Margolis, MD, Center for Health Policy was established in January 2016 with a $16.5 million gift from Duke medical school alumnus Robert J. Margolis and his wife Lisa, through the Robert and Lisa Margolis Family Foundation. Duke-Margolis catalyzes Duke University's leading capabilities including interdisciplinary academic research and capacity for education and engagement, to inform policy making and implementation for better health and health care.

Duke-Margolis partners with funders and experts in healthcare policy and practice from around the world and is advised by an accomplished board of healthcare leaders representing academia, patients, policy research, payers, and providers. The Center has offices and staff on Duke University's campus in Durham, North Carolina and at the Duke in DC offices in the heart of the nation's capital. For more information, visit healthpolicy.duke.edu.

Duke University Center for International and Global Studies (DUCIGS)

The Duke University Center for International and Global Studies (DUCIGS) grounds its research, teaching, and programming on the deep, region and culture-specific knowledge and experience of its organizational units while exploring global topics, pursuing interdisciplinary and cross-regional collaboration, and welcoming new approaches within areas studies and global studies. The mission of DUCIGS is to:

- Support, engage, and connect researchers, students, departments, and schools to work on international issues
- Promote interdisciplinary research and education to understand and engage with challenging global issues
- Support and coordinate the activities of the area studies centers, councils, and initiatives

DUCIGS is home to various international area studies centers, councils and initiatives including:

- Africa Initiative (AI)
- Asian Pacific Studies Institute (APSI)
- Duke Brazil Initiative (DBI)
- Center for Latin American and Caribbean Studies (CLACS)
- Concilium on Southern Africa (COSA)
- Center for Slavic, Eurasian, and East European Studies (CSEEES)
- Slavic and Eurasian Languages Resource Center (SEELRC)
- Duke India Initiative (DII)
- Duke Islamic Studies Center (DISC)
- Duke University Middle East Studies Center (DUMESC)
- Global Asia Initiative (GAI)
- Observatory on Europe
Visit the DUCIGS website at igs.duke.edu to learn more about the many centers and initiatives it houses.

**Center for Documentary Studies**
The Center for Documentary Studies (CDS) at Duke University offers an interdisciplinary program in the documentary arts—photography, audio, film/video, narrative writing, new media, and other means of creative expression—that emphasizes active engagement in the world beyond the university campus. Much more than a traditional educational center, CDS encourages experiential learning in diverse environments outside the classroom, with an emphasis on the role of individual artistic expression in advancing broader societal goals. Programs range widely to include university undergraduate courses, popular summer institutes that attract students from across the country, international awards competitions, award-winning book publishing and radio programming, exhibitions of new and established artists in the center’s galleries, an international documentary film festival, nationally recognized training for community youth and adults, and fieldwork projects in the United States and abroad. For more information, visit documentarystudies.duke.edu.

**Dewitt Wallace Center for Media and Democracy**
The DeWitt Wallace Center for Media & Democracy (DWC) is Duke University’s hub for the study of journalism. DWC studies the interaction between news media and policy, supports watchdog and accountability reporting in the United States and around the world, and teaches about the media’s role in democracy. The center is part of the Sanford School of Public Policy, and shares in the Sanford School’s mission of teaching, research, and policy engagement, with the goal of putting knowledge in service to society. The center offers over twenty undergraduate courses designed to give students a thorough understanding of the principles and the practice of journalism. Together with support from Trinity College of Arts & Sciences, the center hosts the Policy Journalism and Media Studies Certificate, an undergraduate certificate program for students aspiring to become future journalists, or private and public sector leaders who will interact with the media. In addition, the center hosts the Duke Reporters’ Lab and administers the undergraduate Melcher Family Award for Excellence in Journalism. For more information, visit dewitt.sanford.duke.edu.

**DukeEngage**
DukeEngage provides fully-funded opportunities that enable students and faculty to collaborate with organizations across the globe to address critical societal needs through an immersive summer of civic engagement. Each year, Duke undergraduates work with communities on a variety of local issues while developing an understanding of their role in affecting social change and gaining a more nuanced perspective of self, purpose & place in the world. For more information, visit dukeengage.duke.edu.

**Duke Civic Engagement**
Duke Civic Engagement (DCE) strengthens and connects the ways in which Duke partners with communities. DCE supports Duke’s collaborations on pressing social challenges by increasing the capacity of the campus to sustain partnerships and sharing best practices in community engagement. DCE provides trainings, workshops, and consultations; volunteer and partnership opportunities through the ConnectCommunity platform; and a listing of community-based federal work study opportunities. In these ways, DCE aims to advance civic engagement and promote equitable approaches to strengthen partnerships between Duke and the community. For more information, visit civic.duke.edu.

**Technology Resources**

**The Office of Information Technology**
The Office of Information Technology (OIT) is responsible for computing and technology services and support for the university community. OIT’s searchable website offers access to free software, Duke-supported applications, news and training, technical support, and many other resources to help students, faculty, and staff make the most of information technology at Duke. For more information, visit oit.duke.edu.

**Computing and Networking**
All campus buildings, including residence halls, as well as the outdoor space near Bryan Center plaza, are equipped with secure high-speed wireless Internet. Residence halls are also wired for access to Duke’s network. Members of the Duke community are assigned their own email accounts, which they may access from their own computers, the web or from any mobile device using their NetID and password. For more information, visit wireless.duke.edu.

**Printing, Software, and Labs**
The ePrint system enables students to print from computers and mobile devices (using the Pharos print app) to printers distributed throughout campus. Up-to-the-minute status information for all printers is available at the ePrint status page. Dozens of software packages are available for free or at a discount through software.duke.edu. There are also several physical computer labs across campus and a growing array of virtual computer resources as well. Students can also visit specialty labs such as the Multimedia Project Studio and the three Co-Lab Studios (located at the Technology Engagement Center (TEC), the Rubenstein Arts Center, and East Campus), which house 3D printing and other fabrication tools. For more information, visit oit.duke.edu/category/printers-and-labs.

**Technology Training**

Undergraduate and graduate students can take advantage of free in-person or online training on programming, app development, web design, IT security, Adobe Creative Cloud, and more. Online training is accessed through the LinkedIn Learning online training library. The Roots training series offers in-class workshops via the Innovation Co-Lab (colab.duke.edu). For additional information on available opportunities and to sign up for a monthly newsletter, visit oit.duke.edu/training.

**Storage and Backup Services**

Duke offers services for securely storing, backing up, and recovering your personal files. Students receive 50 GB of secure cloud storage through Duke Box at box.duke.edu. Box and most Duke services are protected by Duke’s Multi-Factor Authentication (MFA) two-step verification. Enroll and set up the Duo app at oit.duke.edu/mfa.
Career Center

The Career Center, working in partnership with faculty and colleagues, provides career advising to all Duke undergraduates, graduate students, and alumni. Recognizing the unique talents and needs of each individual, the Career Center encourages students to make the most of their Duke experience by accessing relevant campus resources, developing career interests and values, and establishing and maintaining important human relationships with their peers as well as Duke faculty, staff, and alumni. The Career Center works to build and maintain relationships with alumni and employers who can provide internships and learning opportunities, entry-level positions, and opportunities for experienced professionals. For more information, visit careerhub.students.duke.edu.
Agreements with other Universities

Neighboring Universities

Under a plan of cooperation—the interinstitutional agreement among Duke University and The University of North Carolina at Chapel Hill, North Carolina State University, North Carolina Central University, The University of North Carolina at Charlotte, and The University of North Carolina at Greensboro—a student regularly enrolled in Duke University as a degree-seeking student and paying full fees may enroll for one approved course each semester at one of the institutions in the cooperative program unless an equivalent course is offered at Duke in the same academic term. Under the same conditions, one interinstitutional course per summer may be taken at a neighboring institution participating in this agreement provided that the student is concurrently enrolled at Duke for one full course credit. This agreement does not apply to contract programs such as the American Dance Festival or to study abroad programs.

Approval forms for courses to be taken at these neighboring institutions may be obtained from the offices of the academic deans and the university registrar. Forms are also available online at the Office of the University Registrar website (registrar.duke.edu), in the Registration section. Only those courses not offered at Duke will be approved. Approval must be obtained at Duke from the director of undergraduate studies of the subject of the course and the student's academic dean. Credit so earned is not defined as transfer credit since grades in courses taken under the interinstitutional agreement are entered on the official record and used in determining the grade point average. The courses may be eligible for Areas of Knowledge and Modes of Inquiry coding. The student pays any special fees required of students at the host institution.

Courses taken at The University of North Carolina at Chapel Hill by Duke students in the Robertson Scholarship Program (a joint scholarship program for students at Duke and The University of North Carolina at Chapel Hill) are interinstitutional courses. However, the restriction on the number of courses and the kind of courses (i.e., those not offered at Duke) permitted does not always apply. Robertson Scholars should refer to program materials for specific regulations.

Domestic Exchange Programs

Trinity College has exchange programs with two domestic institutions: Howard University in Washington, DC, and Spelman College in Atlanta, Georgia. Duke students may study for a semester at either institution, while students from these institutions enroll for the same period at Duke. Students may enroll in a wide variety of courses at either Howard University or Spelman College for which they will receive transfer credit at Duke. Transfer credits earned under this exchange program do not count against the maximum allowable domestic or study abroad transfer credits. For more information about these programs, visit 011 Allen.
About

Headquartered in the heart of the Duke University campus, the Nicholas School of the Environment strives for a new paradigm, one that views and attempts to understand the earth and the environment—including humans—as an integrated whole. Addressing problems as well as identifying solutions, the Nicholas School mission is to create knowledge and global leaders of consequence for a sustainable future.

To achieve this vision, the Nicholas School has assembled a unique and talented faculty of more than 150 world-class researchers and educators with expertise spanning forty-five core focal areas in the physical, life, and social sciences. Individually, Nicholas School faculty are leaders in their fields; collectively, they form a community of shared purpose and passion, each steeped and actively engaged in their respective disciplines but also committed to the multi- and interdisciplinary lines of inquiry and collaborations that are at the core of many environmental challenges.

We strive to fulfill our school’s mission by:

- **Creating knowledge** through basic and applied multidisciplinary research designed to expand our understanding of the Earth and its environment;
- **Creating global leaders of consequence** through:
  - an undergraduate academic program designed to spread understanding of the Earth and the environmental ethic to a new cadre of Duke graduates, and prepare them for careers or advanced studies in many in-demand fields;
  - a professional master’s program that combines the specificity of an MS and the practical nature of an MBA or MPP to train a diverse new breed of environmental professionals with in-demand skills needed to devise and implement effective environmental policies and practices in the private, public and nonprofit sectors; and
  - a PhD program dedicated to adding to a new generation of world-class scientists, researchers, and educators in the environment;
- **Forging a sustainable future** by strategically focusing our intellectual resources and capital to address the most challenging environmental issues confronting society on five fronts:
  - energy and resources;
  - climate and impacts;
  - environmental health;
  - ocean and coastal systems; and
  - aquatic and terrestrial systems.

In addition, the following three themes cut across all of the above: governance; economy and policy; data and technology; and our discovery mission in Earth and environmental applied and basic science.

Environmental issues affect us all. We all need to be part of the solution. At the Nicholas School, we believe lasting environmental change depends on embracing and encouraging the rich diversity of talent, perspectives and experiences brought to our field by faculty, staff, students, and alumni from all backgrounds.

The Nicholas School values its strong partnership with Duke’s Office of Institutional Equity and its support of the school’s efforts to create a community that recognizes and values the contributions and concerns of all its members, regardless of their race, ethnicity, national origin, religion, sexual orientation, gender identification, physical capabilities and other important characteristics of their identities. Through organizations such as DICE, BLS, Actionators, oStem, and others, the Nicholas School strives to foster a truly inclusive community committed to the mission of the school.

The Nicholas School acknowledges the indigenous people on whose land the Duke community works, studies, and lives. What is now Durham was originally the territory of several Native nations, including Tutelo and Saponi–speaking peoples. Many of their communities were displaced or killed through war, disease, and colonial expansion. Today, the Triangle is surrounded by contemporary Native nations, the descendants of Tutelo, Saponi, and other Indigenous peoples who survived early colonization. These nations include the Haliwa-Saponi, Sappony, and Oceanechi Band of Saponi. North Carolina’s Research Triangle is also home to a thriving urban Native American community who represent Native nations from across the United States. Together, these Indigenous nations and communities contribute to North Carolina’s ranking as the state with the largest Native American population east of Oklahoma.

Honor Code

The Nicholas School of the Environment advocates the highest standard of professional ethics and academic integrity. Students and faculty have developed an honor code for the school that is distributed to all students prior to matriculation and then discussed and signed during orientation. The Nicholas School uses the Community Standard as its basis.
Due to the COVID-19 pandemic, Duke University has implemented the Duke Compact. The Compact states the values that the university community upholds in order to protect the members of the community during the pandemic. All students must abide by the Compact until advised otherwise. Faculty and staff are also expected to attest to and abide by the terms of the Compact.

History of the Nicholas School

The Nicholas School of the Environment at Duke University represents the joining of three programs whose histories are almost as old as the university itself: the School of Forestry and Environmental Studies and the Duke University Marine Laboratory, both formed in 1938, and the Department of Geology, founded in 1936.

In 1932, forestry instruction was first offered to undergraduate students, and in 1938 the School of Forestry was established as a graduate professional school under the direction of Dean Clarence F. Korstian. Dr. Korstian had joined the faculty in 1931 as the first director of the Duke Forest. Brought to Durham by Dr. William P. Few, president of Duke at the time, Dr. Korstian set out to develop a demonstration and research forest that would serve as a model for owners of small tracts of timber in the South.

The master of forestry and doctor of forestry degrees were offered initially, and later the AM, MS, and PhD were offered through The Graduate School. The school's forestry program has been fully accredited by the Society of American Foresters since 1939.

Growing national concern with natural resources and environmental problems led to a new teaching and research emphasis in ecology in the 1970s. In 1974, the school's name was changed to the School of Forestry and Environmental Studies, and a new degree was added: the master of environmental management (MEM).

The Duke University Marine Laboratory also had its beginnings in the 1930s, when Dr. A.S. Pearse and colleagues from Duke were attracted to Pivers Island and its surrounding abundance of marine life for their summer field studies. The island afforded an excellent location in Beaufort, NC, for a field station. Through the subsequent efforts of Dr. Pearse and others, the land was acquired, and the first buildings of the Duke University Marine Laboratory were built in 1938. Originally, the Marine Lab served only as a summer training and research facility. Today, it operates year-round to provide training and research opportunities undergraduate, graduate students, and visiting scholars.

In 1991, the School of Forestry and Environmental Studies was combined with the Duke University Marine Laboratory to form the School of the Environment. The new school represented an unprecedented university commitment to interdisciplinary education and research in environmental science, policy, and management. It was the only private graduate professional school of its type in the country. The school became the Nicholas School of the Environment in 1995 after a generous gift from Duke graduates Peter and Ginny Nicholas. In 1997, the Division of Earth and Ocean Sciences was created when the former Department of Geology, previously a part of Trinity College of Arts & Sciences, joined the school. This department also dates from the 1930s when Dr. Willard (Doc) Berry was hired as the first geologist at Duke University. By the 1960s, the Department of Geology had established itself as a center for the study of sedimentary geology. Today, as the Division of Earth and Ocean Sciences, it focuses on a number of areas at the intersection of earth and environmental sciences.

In the spring of 2014, the school celebrated the opening of Duke Environment Hall, a 70,000-square-foot facility designed to meet or exceed the criteria for LEED Green Building platinum certification, the highest level of sustainability. Environment Hall was renamed Grainger Hall in 2018 after a naming gift from the Grainger Family Descendants Fund.

Location

Duke University is situated in Durham, a city of more than 263,000 inhabitants in the central piedmont region of North Carolina. The Appalachian escarpment lies approximately one hundred miles to the west of Durham, and the coastal plain is but a short distance to the east. The Duke University Marine Laboratory is located 180 miles to the southeast of Durham, on Pivers Island, adjacent to the historic town of Beaufort, North Carolina. The Nicholas School is thus ideally situated near areas of ecological and topographic diversity that offer many opportunities for study as well as recreation.

Piedmont North Carolina is characterized by a rolling, forested topography interspersed with small farms and rural communities in addition to the state’s largest cities. The climax forests of the piedmont are hardwoods; however, human disturbance has resulted in the establishment of many forests of native southern pines. To the west, the Appalachian Mountains contain magnificent hardwood forests, giving way to spruce-fir forests at higher elevations. The region hosts a large percentage of the rich biodiversity of the southeastern United States.
The coastal plain of North Carolina, well known for its agricultural production, is used extensively by many of the nation's forest industries for plantations of native pines. Coastal wetlands and estuaries, now recognized as one of the nurseries of world fisheries, offer abundant and valuable natural resources. The barrier islands of North Carolina's Outer Banks serve to protect these coastal waters. The rapidly increasing population and development in this region make proper management of its natural resources particularly important to the nation.

Because of the school's central location near these regions of vital ecological importance and rapid human population growth, students are afforded the opportunity to study many current environmental problems in the field. Both the opportunity and the challenge exist to analyze these pressing problems and to develop sound approaches to their management.
## 2022-2023 Academic Calendar

### Summer 2022

**February**  
February 14 (M) Registration begins for all summer sessions

**May**  
May 11 (W) Term 1 classes begin (Monday class meeting schedule is in effect on this day)  
May 13 (F) Drop/Add for Term 1 ends  
May 30 (M) Memorial Day holiday. No classes

**June**  
June 17 (F) Term 1 classes end  
June 20 (M) Juneteenth holiday. No classes  
June 21 (Tu) Reading period  
June 22-23 (W-Th) Final exams  
June 27 (M) Term 2 classes begin  
June 29 (W) Drop/Add for Term 2 ends

**July**  
July 4 (M) Independence Day holiday. No classes

**August**  
August 4 (Th) Term 2 classes end  
August 5 (F) Reading period  
August 6-7 (Sa-Su) Final exams

### Fall 2022

**August**  
August 22 (M) New graduate student orientation begins  
August 24 (W, 4pm) Convocation for new graduate and professional school students  
August 29 (M) Fall semester classes begin

**September**  
September 5 (M) Labor Day. Classes in session  
September 9 (F) Drop/Add ends for fall  
September 29-October 2 (Th-Su) Founders’ Weekend

**October**  
October 8-11 (Sa-Tu) Fall break  
October 24 (M) Shopping carts open for Spring 2023

**November**  
November 2 (W) Registration begins for Spring 2023  
November 23-27 (W-Su) Thanksgiving recess

**December**  
December 2 (F) Graduate classes end  
December 3-13 (Sa-Tu) Graduate reading period  
December 14-19 (W-M) Final exams

### Spring 2023

**January**  
January 11 (W) Spring semester classes begin (Monday class meeting schedule is in effect on this day)  
January 16 (M) Martin Luther King, Jr. Day holiday. No classes  
January 25 (W) Drop/Add ends for spring

**February**  
February 20 (M) Registration begins for Summer 2023
### March
- March 11-19 (Sa-Su) Spring recess
- March 27 (M) Shopping carts open for Fall 2023

### April
- April 5 (W) Registration begins for Fall 2023
- April 19 (W) Graduate classes end
- April 20-30 (Th-Su) Graduate reading period

### May
- May 1-6 (M-Sa) Final exams
- May 12 (F) Commencement begins
- May 14 (Su) Graduation exercises; conferring of degrees

### Summer 2023

### February
- February 20 (M) Registration begins for Summer 2023

### May
- May 17 (W) Term 1 classes begin (Monday class meeting schedule is in effect on this day)
- May 19 (F) Drop/Add for Term 1 ends
- May 29 (M) Memorial Day holiday. No classes

### June
- June 19 (M) Juneteenth holiday. No classes
- June 26 (M) Term 1 classes end
- June 27 (Tu) Reading period
- June 28-29 (W-Th) Final exams

### July
- July 3 (M) Term 2 classes begin
- July 4 (Tu) Independence Day holiday. No classes
- July 6 (Th) Drop/Add for Term 2 ends

### August
- August 10 (Th) Term 2 classes end
- August 11 (F) Reading period
- August 12-13 (Sa-Su) Final exams
Degrees & Divisions

Degree Offerings

Graduate Professional Degrees
Most students entering the Nicholas School seek graduate professional degrees, preparing for careers as expert environmental problem-solvers after two years of study. The master of environmental management (MEM) degree trains students to understand the scientific basis of environmental problems, as well as the social, political, and economic factors that determine effective policy options for their solution with an eye toward forging a sustainable future. Mid-career environmental professionals can also earn the MEM degree through the Duke Environmental Leadership (DEL) Program (through a combination of traditional and distance-learning formats), students focus on environmental management and leadership development. The master of forestry (MF) degree develops experts in sustainable management of forested ecosystems. The Sanford School of Public Policy and the Nicholas School offer an international master of environmental policy (iMEP) degree through a program based at the Duke Kunshan University campus in Kunshan, China. Students enrolling at the Nicholas School also have the opportunity to seek concurrent degrees with The Fuqua School of Business (MBA), Duke Law School (JD), the Sanford School of Public Policy (MPP), the Pratt School of Engineering (MEMP), and the master of arts in teaching (MAT) through The Graduate School.

Doctoral Degrees
The traditional PhD, which is offered to Nicholas School students through The Graduate School, provides the opportunity for students to pursue in-depth interest in a more narrowly focused field in preparation for a career in teaching and/or research or in application-oriented settings. Doctoral students work with faculty in each of the Nicholas School’s three divisions: environmental sciences and policy, earth and ocean sciences, and marine science and conservation.

Undergraduate Degrees
The Nicholas School cooperates with the Trinity College of Arts & Sciences in awarding six undergraduate degrees: the AB in environmental sciences and policy, the BS in environmental sciences, and the AB and BS in marine science and conservation. In addition, minors are offered in environmental sciences and policy, earth and climate sciences, and marine science and conservation. Certificate programs are offered in energy and the environment, and sustainability engagement. Courses for the majors are taught by more than sixty Duke professors in twenty cooperating departments and schools. The Department of Biology offers a BS with a concentration in marine biology that is fulfilled by a semester in residence at the Duke University Marine Laboratory—a major facility of the Nicholas School.

Divisions
The school is composed of three divisions, which serve graduate professional, doctoral, and undergraduate students:

Earth and Climate Sciences
With focal areas in climate change, energy, solid earth processes and surficial processes, the Division of Earth and Climate Sciences (EOS) is headquartered in the Levine Science Research Center on Duke’s West Campus. ECS faculty conduct research all over the world, from the 3,200-meter-deep Hess Deep trench in the Pacific Ocean to the 4,000-meter altitudes of the South American Altiplano.

Environmental Sciences and Policy
With focal areas in ecosystem science and management, environmental health, wetlands, and environmental economics and policy, the Division of Environmental Sciences and Policy (ESP) is headquartered in Grainger Hall. Faculty with training in the biological, physical, chemical, and social sciences work on applied and basic environmental research problems. The division stresses interdisciplinary approaches to environmental problem solving.

Marine Science and Conservation
The Division of Marine Science and Conservation (MSC) strives to be at the forefront of understanding marine environmental systems, their conservation, and their governance through leadership in research, training, and communication. The MSC division is headquartered at the Duke University Marine Laboratory in Beaufort, North Carolina. Faculty research interests include biological and physical oceanography, marine biology and conservation, marine environmental health, marine biotechnology, and marine policy and management.
Facilities

The Nicholas School of the Environment is located in Grainger Hall at 9 Circuit Drive on Duke University’s West Campus, and linked by a walkway to additional space in the Levine Science Research Center (LSRC), home of many of the Nicholas School’s research labs as well as Student Services.

The 70,000-square-foot, five-story glass-and-concrete platinum LEED-certified building incorporates state-of-the-art green features and technologies inside and out. The hall houses classrooms, an auditorium, private offices, open office space, computer labs, an outdoor courtyard, and an environmental art gallery, as well as conference rooms, shared workrooms, and common areas. Green features include solar panels, innovative climate control and water systems, a rooftop event space and garden, windows that moderate light and heat, an organic orchard and sustainably designed landscaping.

The divisions of Earth and Climate Sciences (ECS) and Environmental Sciences and Policy (ESP) are housed across Grainger Hall and the LSRC. ECS maintains state-of-the-art facilities for geochemical analysis and climate modeling studies. ESP hosts extensive research facilities focusing on environmental health.

Duke University Marine Laboratory is home to the third division of the Nicholas School, the Marine Science and Conservation division. Situated on Pivers Island, off the coast of Beaufort, North Carolina, the Marine Lab is Duke’s coastal campus.
Duke University

Duke Forest

The Duke Forest comprises more than 7,000 acres of land in Alamance, Durham, and Orange counties and has been managed for teaching and research purposes since the early 1930s. A variety of ecosystems, forest cover types, plant species, soils, topography, and past land use conditions are represented within its boundaries. In terms of size, diversity, accessibility, and accumulated long-term data, the Duke Forest is a resource for studies related to forest ecosystems and the environment that is unmatched by any other university.

Academic use of the Duke Forest ranges from class instruction to long-term research projects and includes studies on vegetation composition, landscape ecology, remote sensing, invertebrate zoology, atmospheric science, and global climate change. A large volume of information is available to support teaching and research efforts including data on soils, topography, and forest inventory, as well as historic and current management records.

In addition to leading educational tours and field laboratory exercises, Duke Forest Staff are available to assist faculty, students, teachers, and researchers in project development—from site selection and logistics to utility hook-ups and stand management. To initiate or lead academic activities in the Duke Forest, please contact the Office of the Duke Forest at dukeforest@duke.edu. More information can also be found online at dukeforest.duke.edu.
Nicholas Institute for Environmental Policy Solutions

The Nicholas Institute for Environmental Policy Solutions has built its reputation on providing unbiased evaluations of policy risks and rewards tailored to decision makers’ needs. These evaluations have allowed the Nicholas Institute to improve environmental policymaking worldwide through objective, fact-based research to confront the climate crisis, clarify the economics of limiting carbon pollution, harness emerging environmental markets, put the value of nature’s benefits on the balance sheet, develop adaptive water management approaches, and identify other strategies to attain community resilience.

The Nicholas Institute is part of Duke University and its wider community of world-class scholars. This unique resource allows the Nicholas Institute’s team of economists, scientists, lawyers, and policy experts not only to deliver timely, credible analyses to a wide variety of decision makers, but also convene these decision makers to reach a shared understanding of this century’s most pressing environmental problems. The results of these efforts are reflected in accounts of our researchers’ contributions to improved decision making and novel approaches to environmental issues as well as by reflections of students and former employees who have used access to the Nicholas Institute’s experts to effect positive lasting change in the environmental policy space. To learn more about the impact of the institute, visit nicholasinstitute.duke.edu/about/our-impact.

The Nicholas Institute occupies three houses on Campus Drive on Duke’s West campus, but it also has staff in Duke’s Washington, DC, office and at the Duke Marine Lab in Beaufort, North Carolina.

Working with Students

Educating the next generation of environmental leaders is one of the many ways the Nicholas Institute is helping to bridge the gap between science and policy. Staff members aid in this mission by teaching courses across campus and partnering with students on research projects. Nicholas School doctoral and professional graduate students as well as students from other Duke units and universities can work with the Nicholas Institute as interns and engage in research through the Nicholas School’s assistantship program.

In 2013, the Nicholas Institute created the Duke Environmental Economics Doctoral Scholars (DEEDS) program, a competitively funded fellowship to foster dynamic intellectual exchange among the Nicholas Institute, Duke doctoral students in environmental economics, and Duke University faculty. The DEEDS program offers support to doctoral students working with and being mentored by a Duke faculty member in collaboration with the Nicholas Institute and the University Program in Environmental Policy.

To learn more about the institute’s offerings for students, visit nicholasinstitute.duke.edu/education.

Publications and Events

The Nicholas Institute offers a policy-neutral, data-rich environment for stakeholders to discuss complex topics. The insights from that interdisciplinary dialogue are reflected in a large body of substantive research across six programs. For more information, read the latest publications (nicholasinstitute.duke.edu/publications) and engage with the institute at an upcoming event (nicholasinstitute.duke.edu/events).
General Information

The Duke University Marine Laboratory is a campus of Duke University and a unit within the Nicholas School of the Environment. The Division of Marine Science and Conservation (MSC) strives to be at the forefront of understanding marine environmental systems, their conservation, and their governance through leadership in research, training, and communication.

The Marine Laboratory campus serves year-round resident Duke faculty in the Division of Marine Science and Conservation who, together with research and administrative staff, provide training, educational, and research opportunities. Duke academic programs served by the Marine Laboratory campus include undergraduate students, graduate degree students, and doctoral students. Students and post-graduates from other colleges may enroll for one or more semesters or summer sessions. Visiting student groups use the Laboratory's dormitory and laboratory facilities and scientists come from North America and across the globe to conduct research on the campus. A weekly seminar/lecture series features distinguished scientific speakers from across the nation and abroad.

Location and Natural Environment

The Marine Lab is situated on Pivers Island, near the historic town of Beaufort. Beaufort is the third-oldest town in North Carolina and is surrounded by fishing, agricultural, and leisure-tourism communities. The area is well known for its historic and scenic attractions as well as being a seaside recreation destination. Cape Lookout National Seashore and the Rachel Carson Estuarine Research Reserve are within easy boating distance.

The laboratory is within range of both temperate and tropical species of marine biota. The edge of the Gulf Stream oscillates between thirty and forty miles offshore, with reefs on the wide continental shelf and habitat for marine vertebrates. The coastal region of North Carolina is a system of barrier islands, sounds, and estuaries rich in flora and fauna, and other diverse habitats, including rivers, creeks, mud flats, sand beaches, dunes, marshes, peat bogs, cypress swamps, bird islands, and coastal forests. It is a haven for both nature lovers and those interested in the pursuit of marine science.

Two other university laboratories, federal and state laboratories, plus a museum, and an aquarium in the Beaufort-Morehead City area collectively house one of the highest concentrations of marine scientists in the nation. These are the University of North Carolina's Institute of Marine Sciences (IMS), North Carolina State University's Center for Marine Science and Technology (CMAST), the North Carolina State University Seafood Laboratory, the National Oceanic and Atmospheric Administration's (NOAA) Beaufort Laboratory, the North Carolina Divisions of Marine Fisheries and Coastal Management, the North Carolina Maritime Museum, and the North Carolina Aquarium at Pine Knoll Shores. This concentration of marine scientists provides a critical mass for the pursuit of science, conservation, and education.

Teaching and Research Facilities

The Marine Lab campus features dormitories, a dining hall, a student center, classrooms, laboratories, and research buildings. The Marguerite Kent Repass Ocean Conservation Center, the Marine Lab's first LEED-certified building and Duke University's second building to receive a rating of LEED Platinum. The Orrin Pilkey Research Laboratory was dedicated in 2014 and provides the Marine Lab with a state-of-the-art space for studying molecular biology, genomics, marine microbes, and community ecology. The Pilkey Laboratory includes a conference room and a teaching lab where faculty and students can apply advanced genetic tools and techniques toward understanding marine systems and marine ecosystems. The Pilkey Laboratory was designed with sensitivity to the changing coastal environment—including site design utilizing prevailing winds and sunlight, geothermal heating and cooling systems, and recycled and regional materials—and is LEED Gold certified.

In addition to modern analytical facilities, the Marine Lab operates a variety of seawater systems and tanks for experimental work. The Marine Lab maintains modern computer facilities and IT services, including state-of-the-art video conferencing facilities. The Pearse Memorial Library at the Marine Lab is a component of the Duke University Library System. Computer and library facilities are described in further detail in the sections highlighting the Computer and Library Resources of the Nicholas School and Duke University. The Marine Lab features a new, fully equipped and state-of-the-art shared-use Marine Conservation Molecular Facility in the Bookhout Research Laboratory. This laboratory enables a range of genetic studies from genomics to populations genetics and forensics. In 2015, the Marine Lab opened the Marine Robotics and Remote Sensing Lab led by faculty member Dave Johnston. The new facility has enabled the Marine Lab to conduct cutting edge research around the globe, partner with other research facilities, and engage local school groups. The Marine Lab's newest vessel, the R/V Shearwater arrived in early 2020. The vessel allows researchers and other institutions to conduct research along the Atlantic seaboard in a wide range of vital fields, including marine ecology and conservation, biological oceanography, and renewable ocean energy development. The mission of the vessel is research, education, and outreach. The lab
also operates the R/V Richard T. Barber, a 30-foot aluminum vessel used mostly for nearshore and offshore faculty and student research; the R/V Kirby-Smith, a 28-foot Carolina Skiff with a capacity of eighteen passengers used mostly for student research and teaching; and a fleet of kayaks and canoes for research and teaching.

**Undergraduate Study at the Duke University Marine Laboratory**

All undergraduate students at Duke, no matter what their major, have the opportunity to study at the Duke University Marine Laboratory in Beaufort, North Carolina. Academic programs include a fall semester, a spring semester and two five-week summer terms. The fall and spring semesters include Beaufort Signature Travel Courses with extended field trips to Australia, Mexico, Puerto Rico/ St. Croix, Panama, or Singapore. The academic programs integrate classroom lectures and laboratories with direct field and shipboard experiences. For more information, visit the Duke Marine Lab website at nicholas.duke.edu/marinelab.

A semester or summer term of coursework at the Marine Lab is a core requirement of the BS major in biology with a concentration in marine biology. For more information see biology.duke.edu/undergraduate/major/concentrations/marine-biology.
Regional Resources

Research Triangle Park

Numerous industrial and governmental organizations have established research facilities in the Research Triangle Park, ten miles from the Duke campus. US government facilities include a major research laboratory of the Environmental Protection Agency, the Forestry Sciences Laboratory of the United States Forest Service, and the National Institute of Environmental Health Sciences (NIEHS). These laboratories provide opportunities for student research and internships in some of the nation’s most advanced research facilities.

Forest History Society

Founded in 1946, the Forest History Society is a nonprofit, nonadvocacy organization committed to balanced and objective investigations of human interaction with the forest environment. In 1984, it became affiliated with Duke University and moved its headquarters to Durham. The Forest History Society copublishes the quarterly journal *Environmental History* and maintains a large collection of archival materials, including records from the American Forestry Association, American Forest Institute, National Forest Products Association and the Society of American Foresters. These valuable resources and the services of the society’s reference staff are available to Nicholas School students. The society also provides the F. K. Weyerhaeuser Fellowship for a graduate student studying forest conservation history (see Financial Aid sections in chapters for professional degree and doctoral students in this bulletin) and cosponsors the Lynn W. Day Distinguished Lectureship in Forest & Conservation History with the Nicholas School and the Department of History. For more information, visit foresthistory.org or call (919) 682-9319.

Carolina Population Center

The Carolina Population Center is a community of outstanding scholars who promote population research and education at The University of North Carolina at Chapel Hill. The CPC offers classes and seminars and supports its own library as well as an online catalog of resources. The Nicholas School collaborates with the Carolina Population Center as a member of its Integrative Graduate Education and Research Training (IGERT) grant from the National Science Foundation. For more information, visit cpc.unc.edu.

Center for Sustainable Enterprise

Based at the Kenan-Flagler School of Business at The University of North Carolina at Chapel Hill, the Center for Sustainable Enterprise has provided over a decade of vision and impact, creating leaders for the world they envision and using business to innovate for global change. The CSE world class curriculum (fourteen sustainability-related classes this fall), real-world applications, and relevant research help students and companies succeed with sustainable strategies. Nicholas School students with interests in business and the environment, industrial ecology and sustainable business practices frequently enroll in courses offered by this center. For more information, visit cse.unc.edu.

Organization for Tropical Studies at Duke

The Organization for Tropical Studies (OTS) is a nonprofit consortium that has grown to include sixty-three universities and research institutions from the United States, Latin America, and Australia. In the early 1960s, scientists from US universities forged working relationships with colleagues at the Universidad de Costa Rica in the interest of strengthening education and research in tropical biology. Intense interest both in the United States and Costa Rica led to the founding of OTS in 1963. OTS was founded to provide leadership in education, research, and the responsible use of natural resources in the tropics. To address this mission, OTS conducts graduate and undergraduate study abroad programs, facilitates scientific research, participates in tropical forest conservation, maintains three biological stations in Costa Rica, and another in Kruger National Park, South Africa. For more information, visit tropicalstudies.org.
Research Centers

Research centers in the Nicholas School of the Environment are by design and intent flexible, multidisciplinary units. A major aim is to bring together specialized groups of scholars and professionals from many disciplines to focus their attention on current natural resource and environmental problems. The centers are headed by a director and staffed by an interdisciplinary faculty from Duke, neighboring universities and a variety of public and private research organizations. Depending on the level of funding, the centers may also employ research assistants and other support staff. The centers do not offer courses or degrees; rather, they offer students, scientists, and other professionals an opportunity to participate in research through collaboration with affiliated faculty.

Grainger Center for River Science

Co-Directors: Martin Doyle, Professor of River Science and Policy, Division of Environmental Sciences and Policy, Nicholas School of the Environment; James Heffernan, Assistant Professor of Ecology, Division of Environmental Sciences and Policy, Nicholas School of the Environment; and Emily Bernhardt, Gerry G. and Patricia Crawford Hubbard Professor of Biogeochemistry, Division of Environmental Sciences and Policy, Nicholas School of the Environment, and Director of Graduate Studies, Ecology PhD program (UPE)

The River Center was formed in 2011 as an intellectual community of faculty, postdocs, students and technical staff who share a common passion for the study of rivers and their watersheds. The current group consists of three Duke research labs (Doyle, Heffernan, and Bernhardt) that have an interest in advancing river science. Current research in the multidisciplinary labs spans watershed hydrology, geomorphology, ecology, biogeochemistry, and environmental economics and social sciences. Researchers in these labs also seek to inject the best possible science into ongoing discussions about stewardship of river ecosystems and their watersheds through policy and management. Research in the River Center includes both close collaborations among the core River Center labs and work with other faculty in the Nicholas School, in other departments at Duke, and with collaborators around the nation and the world.

The physical home of the River Center is located in the Duke Water Science Laboratory and Research Center, a state-of-the-art facility containing shared lab space and a shared analytical facility. Find more information at dukerivercenter.org.

Duke University Wetland Center

Director: Curtis J. Richardson, John O. Blackburn Distinguished University Professor of Resource Ecology, Division of Environmental Sciences and Policy, Nicholas School of the Environment. Associate Director: Brian R. Silliman, Rachel Carson Distinguished Professor of Marine Conservation Biology, Division of Marine Science & Conservation, Nicholas School of the Environment

The goal of the Duke University Wetland Center is to provide sound scientific knowledge that will lead to sustainable wetland ecosystem functions and services locally, nationally, and globally. The center works toward this goal by conducting, sponsoring, and coordinating research and teaching on critical wetland issues, especially wetland and stream restoration, climate change effects on wetland nutrient cycling, carbon sequestration, invasive species, and the role of wetlands in improving water quality and retention on the landscape.

Perhaps no single environmental issue has so polarized public opinion as the protection of wetlands. Part land, part water, wetlands are ecosystems in which water level and low oxygen support a unique ecological habitat conducive to the development of specific plant and animal species. Wetlands improve water quality, provide flood control, supply habitat for fish, and are a vital link between surface water and groundwater. They also store over 30% of the world’s carbon. Unfortunately, much of the public, not knowing about these functions and services, believe wetlands are of low value and should be drained or developed. As a result, the United States has lost over 50% of its wetlands.

By bringing together scientists, educators, and professionals, the Duke University Wetland Center is able to focus attention on wetland issues of regional, national, and international scale. Core researchers for the center are the director, faculty, visiting scholars, and graduate students. As part of a professional school within a private university, the Duke University Wetland Center works independently on wetland issues without the political pressures often brought to bear upon public institutions. Find more information at wetland.nicholas.duke.edu.

Superfund Research Center

Director: Richard Di Giulio, Sally Kleberg Professor of Environmental Toxicology, Division of Environmental Sciences and Policy, Nicholas School of the Environment

It is increasingly recognized that early life stages of humans and other organisms are particularly sensitive to environmental stressors such as pollutants. The Superfund Research Center unites researchers from the Nicholas School of the Environment, the Pratt School of Engineering, and the Duke University Medical Center in examining the effects of selected chemicals that are widespread in the
environment, including Superfund sites. Of particular concern are effects on wildlife and human development, later life consequences of early life exposures, and new strategies for remediating heavily polluted areas such as Superfund sites. The center is supported by the National Institute of Environmental Health Sciences (NIEHS).

The goal of the center is to elucidate exposures, mechanisms of toxicity, health consequences in humans and ecosystems, and remediation strategies for specific toxic chemicals selected based upon their potential importance as developmental toxicants. Of particular interest are selected pesticides, metals, hydrocarbons, and flame retardants that affect development of the nervous system, cardiovascular system, and endocrine systems. In addition to conducting basic research in these areas, the center’s key activities include undergraduate, graduate, and post-doctoral training in the environmental health sciences and engineering, the translation of basic research findings into useful information for health professionals, government agencies, and the public, and active engagement with communities concerned with exposures to hazardous chemicals. Find more information at sites.nicholas.duke.edu/superfund.
Student Organizations

Nicholas School Executive Education (NSEE) Program

The Nicholas School Executive Education (NSEE) program manages non-degree short courses for environmental professionals. They are outside of the credit-bearing course catalog, designed with the working environmental professional (including Nicholas School alumni) in mind. These courses focus on topics that will develop the ability to spearhead environmental change and leadership by utilizing Nicholas School resources outside of degree programs. While executive education courses are intended for a professional audience, there are opportunities for students to participate in these offerings, per NSEE policy guidelines and permission. For more information, please contact execed@nicholas.duke.edu.

Duke Environmental Law and Policy Forum (DELPF)

DELPF is a student-run publication, staffed by students from the Duke Law School, the Nicholas School and the Sanford School of Public Policy. New journal members, both JD and non-JD, are selected based upon their writing skills, research ability, and interest in both DELPF and environmental policy. The staff produce the biannual journal Duke Environmental Law and Policy Forum as an outlet for scholarly work in environmental law, policy, economics, and science. Recent issues of the journal have dealt with climate change, environmental justice, and land use.

Nicholas School Chartered Groups

Nicholas School Student Council (NSSC) is an advocate on behalf of professional students, representing the interests and concerns of these students to the Duke University and Nicholas School community. The NSSC is a group of elected and volunteer-appointed Masters of Environmental Management (MEM) and Masters of Forestry (MF) students that serves as an advisory body to the faculty and administration and provides a conduit between the student body, faculty, and administration.NSSC also coordinates the annual Earth Day and Field Day activities.

Nicholas PhD Advocacy Council (NPAC) is a group composed of peer-elected students from the Nicholas School-affiliated PhD programs (ENV, UPE, UPEP, MSC, TOX, EOS) which aims to represent and support the academic and professional interests of all Nicholas School-affiliated PhD students, while fostering a sense of community within the Nicholas School. NPAC aims to:

1. Strengthen professional and social relationships among students in Nicholas School-affiliated PhD programs (e.g., through professional development activities such as the Graduate Afternoon Seminar).
2. Advocate for the academic and professional interests of Nicholas School-affiliated PhD students.
3. Provide support to program administrators for PhD student needs (e.g., Nicholas School PhD student orientation).
4. Provide representation for Nicholas School-affiliated PhD students to other administrative and advocacy groups (e.g., Nicholas School faculty meetings, Duke Graduate and Professional Student Council).

Professional Groups

Duke Water Network (DWN) is a student organization dedicated to connecting Duke students interested in water with each other, community members, and professionals in the fields of water management, science, policy, and business. DWN may organize employer and alumni networking events, trips to explore innovative water management approaches, talks and panels, and other events that fulfill its mission.

Eno Literary Magazine (Eno) has a mission to encourage, promote, and publish artistic forms of expression that inspire a deeper understanding and appreciation for the environment. The magazine aims to inspire artists to create work celebrating nature and to encourage consumers to reflect and act in service of the environment.

Green Roof and Orchard Workforce (GROW) is an inclusive, member-driven organization within NSOE that manages the rooftop garden space and orchard. The purpose of the group is to promote awareness and understanding of the functions and benefits of building-integrated green space, facilitate the proper and productive use of the Nicholas School’s green roof and orchard for communal enjoyment and benefit, support the Nicholas School’s spirit of community outreach and education, and promote community development and build social capital through shared stewardship and events.

Nicholas School Energy Club (NSEC) has a mission to educate Nicholas School students and the broader Duke community about energy issues and provide professional development opportunities in energy through networking events, field trips, socials, and conferences. NSEC coordinates activities with the Duke University Energy Initiative and partner energy clubs at the Fuqua School of Business and the Sanford School of Public Policy.

Ocean Policy Working Group (OPWG) focuses on the political, economic, and cultural dimensions of human interactions with the
Duke University

Ocean. The group brings together graduate and professional students from a variety of disciplinary backgrounds to consider the ways in which their areas of study influence perceptions of the ocean. In addition, the group’s biannual publication, *Upwelling*, is a great way for members, faculty, and alumni to showcase their policy work with the greater Duke community.

**Student Association for Geospatial Analysis (SAGA)** is a graduate student organization for students interested in developing and sharing skills related to geospatial analysis. The mission of SAGA is to provide the graduate students of Duke University with a resource to expand, explore, and build professional skills in the field of Geospatial Analysis. SAGA serves as an organization to inform students about emerging trends and techniques, as well as to develop skills not taught through Nicholas School curriculum.

**Social Groups**

**Diverse & Inclusive Community for the Environment (DICE)** fosters a welcoming community within the Nicholas School so that members of disenfranchised groups/communities will feel that they belong in the community. This means bridging gaps between peoples of various identities by both acknowledging their differences and also learning to recognize shared interests and experiences. DICE seeks to empower members of disenfranchised groups/communities to join the Nicholas School community. This means working with the Nicholas School administration and staff to increase the recruitment rates for students of different races, cultures, gender and sexual identities, levels of ability/disability, socioeconomic classes, countries of origin, religions, and ethnicities.

**Nicholas School's Black & Latinx Club (BLC)** is a student group providing a space to celebrate and educate the Nicholas School community on Black and Latinx culture. It serves the needs of not only Black and Latino students but also any student, faculty, or staff member who wishes to engage in meaningful activities that build cultural, academic, and environmental awareness.

**Nicholas School Partners and Spouses (NicPartners)** exists to make students and their partners feel welcome at the Nicholas School and in the Duke community, to ease the transition process to Durham through social networking, to promote inclusion and diversity, and to strengthen the bond between families and the Nicholas School.

**Nic Queer Network (NQN)** represents the needs and concerns of students, staff, faculty, and other Nicholas School community members who identify as LGBTQIA+ or allies.

**Nicholas School Naturalists (NicNats)** is a natural history and outdoors club within the Nicholas School of Environment. Outdoor trips, which include hiking, backpacking, climbing, rafting, canoeing, birding, scuba diving, and more, are open to any graduate students within the Nicholas School.

**FOREM** is the official unofficial social organization of the Nicholas School. It is a social professional organization for all Nicholas School graduate students, faculty, and staff. The group’s purpose is to foster an environment in which students can balance their academic and social lives.

**Duke Affiliates—Societies, Chapters, Clubs and Initiatives**

**African Environment Initiative (AEI)** is a student organization with the goal of promoting greater interdisciplinary collaboration among the community of Duke researchers (from both the Nicholas School and other departments) working in Africa. The group seeks to act as liaisons between Nicholas School students and the diverse Africa-related programs (including the Duke Africa Initiative and the department of evolutionary anthropology) within Duke University.

**Duke Chapter of American Fisheries Society (DukeFish)** is the graduate student chapter of the American Fisheries Society (AFS) at Duke University. AFS is an international organization whose mission is to promote and improve the conservation and sustainability of fishery resources and aquatic ecosystems. It is the oldest and largest fisheries professional society, established in 1870. The group promotes sustainable fisheries and consumer practices by reaching out to our peers, community members, and local industries through education, outreach, and community participation.

**Duke Conservation Society (DCS)** is a student group focusing on contemporary conservation issues and solutions. The group covers a variety of fields and explores multiple forms of conservation including wildlife, land trusts, market-based, community-based, and policy-based among others. The group’s vision is to provide a resource for students and future conservationists in finding solutions to the natural world’s most pressing problems.

**Duke Environmental Law and Policy Forum (DELPF)** began in 1991 as an interdisciplinary magazine published annually. Since then, the Forum has grown into a traditional environmental law journal. DELPF has retained its interdisciplinary roots and presents scholarship that examines environmental issues by drawing on legal, scientific, economic, and public policy resources. DELPF’s affiliations with the Nicholas School for the Environment, the Sanford School of Public Policy, and the Law School render it uniquely positioned to adapt to the increasingly interdisciplinary nature of environmental law. DELPF is a student-run publication, with staff members from the Law School, the Nicholas School for the Environment, and the Sanford School of Public Policy. New journal members, both JD and non-JD, are selected based upon their writing skills, research ability, and interest in both DELPF and environmental policy.
Society of American Foresters (SAF), Duke Chapter, is the national scientific and educational organization representing the forestry profession. The Duke University Student SAF Chapter is a professional organization that facilitates student involvement in forestry at the local, regional, and national levels by promoting the forestry program at the Nicholas School, sustaining Duke’s relationship with other forestry schools, organizing both educational and community service events, and facilitating student attendance at SAF national conferences and meetings.

Duke Student Association of Wetland Scientists (SAWS) is a student-run organization dedicated to wetland ecology, restoration, and conservation at Duke University. The goal is to provide a meeting ground for graduate and non-graduate students interested in all aspects of wetlands. Activities include field trips, seminars, and volunteer events. The club works in coordination with the Duke University Wetlands Center.

Sustainable Oceans Alliance (SOA), Duke chapter, strives to equip students who have a passion for ocean conservation with the tools to help make a change. Duke SOA aims to enhance the university’s ability to support the needs and interests of student who intend to pursue marine science and conservation, both educationally and professionally. SOA provides a forum for Duke students interested in marine science and conservation, education for the Duke community about opportunities in the marine sciences available at Duke and the Duke Marine Lab, and facilitation for those students wishing to study at the Duke Marine Lab.

Duke Sustainability Board initiates and supports activities to help the Duke community move towards a more sustainable existence.

MEM/MBA Club is the home for concurrent MEM/MBA students and provides the key link between the Nicholas School and Fuqua School of Business. The club’s mission is to support students’ academic transition between two graduate programs, facilitate social cohesion, and encourage professional development through Duke’s unique hybrid education. The MEM/MBA program—both within Duke and externally through increased visibility and outreach to the Nicholas School of the Environment, The Fuqua School of Business, and the UNC Kenan-Flagler Business School—actively works with school administrations to streamline MEM/MBA academics and administrative processes.

Nicholas School Net Impact is the Nicholas School chapter of the national Net Impact organization. It is a networking and professional development club that connects Nicholas School students with environmental professionals in the private sector and provides access to resources for further business related education.

The Coastal Society (TCS) is an organization of private sector, academic, and government professionals and students. TCS is dedicated to actively addressing emerging coastal issues by fostering dialogue, forging partnerships, and promoting communication and education. The Duke University Student Chapter of TCS seeks to fulfill this mission of coastal stewardship through education and restoration.

Working Group on the Environment in Latin America (WGELA) is a collaborative effort between Duke University, the University of North Carolina, and North Carolina State University undergraduate and graduate students to promote a rich comprehension of environmental issues in Latin America through interdisciplinary collaboration. WGELA aims to foster a dialogue concerning critical environmental issues affecting Latin America. The group also seeks to improve the understanding of the social, historical, political, and cultural contexts in which these environmental issues are embedded, and build capacity among an interdisciplinary and cross-institutional group of individuals to address and conduct research on Latin American issues.
Technology at the Nicholas School

Nicholas School IT maintains computer labs and shared printers, and provides audio-visual and technology support to students, faculty, and staff in all divisions and across both campuses. Software available in Nicholas School IT computer labs includes ArcGIS, ENVI, Adobe Creative Cloud, NVivo, MATLAB, Mathematica, Stata, and R.

As an early adopter of telepresence services at Duke University, Nicholas School conference rooms are configured with equipment for seamless video conferencing with the Marine Lab campus in Beaufort, NC and elsewhere. Specialized Zoom classrooms are utilized for remote and hybrid instruction.

Students can purchase computers and accessories from the Duke Technology Center located on the lower level of the Bryan Center, and have those machines serviced at Duke Computer Repair located on Hillsborough Road, just a short distance from campus.

Links to technology product and support information available on campus is accessible on the Nicholas School Intranet with your NetID credentials: Quick Reference Links – Intranet – Nicholas School of the Environment (duke.edu).
Undergraduate Degree Programs

The Nicholas School cooperates with the Trinity College of Arts & Sciences in awarding six undergraduate degrees: the AB in environmental sciences and policy, the BS in environmental sciences, the AB and BS in earth and climate sciences, and the AB and BS in Marine Science and Conservation. In addition, minors are offered in environmental sciences and policy, earth and climate sciences, and marine science and conservation. Certificate programs are offered in energy and the environment, and sustainability engagement. Courses for the majors are taught by more than sixty Duke professors in twenty cooperating departments and schools. The Department of Biology offers a BS with a concentration in marine biology that is fulfilled by a semester in residence at the Duke University Marine Laboratory—a major facility of the Nicholas School.

In addition, minors are offered in both environmental sciences and policy and earth and climate sciences. Courses for the majors and minors are taught by Nicholas School faculty and professors in cooperating departments and schools within Duke University. Information about these majors and minors is available through the undergraduate office in A106 LSRC (undergradadmin@nicholas.duke.edu) or through the program website, nicholas.duke.edu/academics/undergraduate-programs.

All applications for undergraduate studies at Duke University are submitted to the Office of Undergraduate Admissions, and admission is offered by Trinity College of Arts & Sciences or the Pratt School of Engineering. All applicants should contact the Office of Undergraduate Admissions or visit their website at admissions.duke.edu.

Majors and Minors

- Earth and Climate Sciences (AB)
- Earth and Climate Sciences (BS)
- Earth and Climate Sciences Minor
- Environmental Sciences (BS)
- Environmental Sciences and Policy (AB)
- Environmental Sciences and Policy Minor
- Marine Science and Conservation (AB)
- Marine Science and Conservation (BS)
- Marine Science and Conservation Minor

Undergraduate Certificates

- Energy and the Environment
- Sustainability Engagement

Academic Recognition

The Sara LaBoskey Award is given annually by the Nicholas School to a graduating senior in environmental science/policy in recognition of personal integrity and academic excellence. The award was established by Vicki and Peter LaBoskey in memory of their daughter, Sara LaBoskey.

The Thomas V. Laska Memorial Award is given annually by the Division of Earth and Climate Sciences of the Nicholas School to a graduating senior in recognition of outstanding achievement and promise for future success in earth and ocean sciences. The award was established by Andrew J. and Vera Laska in memory of their son, Thomas Vaclav Laska.

The Marine Science and Conservation Award is given annually by the Duke University Marine Lab to a graduating senior with a demonstrated passion and commitment to marine science and conservation and to the Marine Lab community in Beaufort and in Durham.
Financial Assistance

The Duke Undergraduate Financial Aid Office handles all financial aid matters, and the Bulletin of Undergraduate Instruction includes information about scholarships available to Duke undergraduates as well as loans and tuition payment plans.

Marine Lab Scholarships

The following scholarships are available to undergraduates wishing to study at the Duke University Marine Laboratory.

Summer Tuition Scholarships

Duke Marine Lab Summer Tuition Scholarships are available to all students enrolled in marine science summer courses. A student may receive only one summer tuition scholarship per summer. The precondition for review of a scholarship application is admission to a specific summer course. Admission to courses does not automatically imply award of a scholarship; separate reviews are conducted. Please contact the Duke Marine Lab Enrollment Office at ml_enrollment@nicholas.duke.edu to apply for a summer tuition scholarship. Applicants are required to submit a letter of recommendation from academic faculty and a brief statement of purpose, i.e., the reason for taking the particular course and demonstrate a need for the scholarship. The deadline is March 22. Details are available online at nicholas.duke.edu/marinelab/academics/undergraduate/scholarships-financial-aid.

Bookhout Research Scholarship

The Bookhout Research Scholarship is offered for students interested in research related to the invertebrate zoology of marine animals. Support includes a full tuition scholarship to take Research Independent Study during Summer Term 1 or Summer Term 2. A student may receive only one summer tuition scholarship per summer. The only requirement for the research project is that it involves some aspect of the biology of invertebrate animals. The scholarship recipients will be assigned to a faculty sponsor based upon their stated interests or the recipients may request a specific faculty advisor. The deadline is March 22. Details are available online at nicholas.duke.edu/marinelab/academics/undergraduate/scholarships-financial-aid.

The Stanback Fellowship Program

The Nicholas School offers paid summer learning experiences to any currently enrolled Duke undergraduate student through the Duke University Stanback Fellowship Program. Made possible by the support of Fred and Alice Stanback, the program provides students with significant work experience in grassroots conservation, advocacy, applied resource management, or environmental policy. More information is available at nicholas.duke.edu/careers/students/stanback-fellowship-program.
Professional Graduate Degree Programs

The Nicholas School of the Environment offers three professional graduate degrees—the Master of Environmental Management, the Master of Forestry, and the international Master of Environmental Policy—all of which prepare students for careers in a wide variety of employment settings, including government agencies, private industry, consulting, nonprofit organizations, and international organizations.

The Distinction between Professional and Doctoral Degrees

Professional graduate programs such as the Master of Environmental Management (MEM) (including the Duke Environmental Leadership MEM), Master of Forestry (MF), and international Master of Environmental Policy (iMEP) differ from traditional MS/PhD programs both in terms of the career goals of students and in terms of curricula. The MEM, MF, and iMEP equip graduates to begin or advance in a professional career related to environmental policy and management. Most MEM, MF, and iMEP graduates hold management and staff positions in which they are expected to compile, analyze, and interpret natural and social science data and then use the data to formulate a plan for action.

The MEM, MF, and iMEP curriculum reflects these employment goals. Coursework provides a strong scientific and analytical foundation for management-oriented decision making. A master’s project supplements the coursework by allowing students to demonstrate their organizational and analytical skills in solving an environmental management problem in their areas of specialization.

Although the MEM, MF, and iMEP degrees are not designed as precursors to the PhD, students who later choose to enter PhD programs are well prepared and suffer no disadvantage from taking a professional master’s degree first.

Students desiring to concentrate their study and research within a well-defined subject area and planning for careers primarily in university teaching and research are encouraged to pursue the doctoral (PhD) degree. Most Nicholas School faculty train doctoral students at Duke. Prospective PhD students should consult the chapter in this bulletin on doctoral degrees as well as the bulletin of The Graduate School of Duke University. For more detailed information, visit The Graduate School website.

Professional Master’s Degrees

The Master of Environmental Management degree is designed to help students develop the professional management skills required to confront challenges at the intersection of the natural environment and society. MEM degree candidates choose one of these programs of study:

- Business and Environment
- Coastal Environmental Management
- Ecosystem Science and Conservation
- Ecotoxicology and Environmental Health
- Energy and Environment
- Environmental Economics and Policy
- Water Resources Management

Students pursuing the Master of Forestry (MF) focus their studies on sustainable forest management. The MF is accredited by the Society of American Foresters.

The Nicholas School of the Environment and the Sanford School of Public Policy collaborate to offer a two-year international Master of Environmental Policy (iMEP) Program based at the Duke Kunshan University campus in Kunshan, China. Duke Kunshan’s iMEP Program prepares its graduates to meet the pressing environmental and economic challenges facing the international community through effective policy solutions by drawing from an array of disciplines. The Duke Environmental Leadership (DEL) Program offers a Master of Environmental Management degree for mid-career environmental professionals (DEL-MEM). This program is taught via a combination of distance and place-based, in-person learning. It requires students to attend five short place-based sessions over the course of study. Applicants for the DEL-MEM Program must have a minimum of five years of relevant professional environmentally-related experience. Students who successfully complete the DEL-MEM Program are awarded the Master of Environmental Management degree.

Contact Information

For more information about the MEM or MF, contact nicholas-admissions@duke.edu or (919) 613-8070 or visit nicholas.duke.edu/academics/masters-programs/master-environmental-management or nicholas.duke.edu/academics/masters-programs/master-forestry.
Program Requirements

Each of the Nicholas School’s professional programs requires the completion of 48.0 course credits (please see the section on Special Tracks for Practicing Professionals—Duke Environmental Leadership—Master of Environmental Management for specific program requirements related to the Master of Environmental Management degree offered through the Duke Environmental Leadership program). These units are distributed among a set of courses required by each program listed above: core courses, quantitative courses, electives, tools, a master’s project, and seminars relevant to the program’s objectives. More specific information about requirements for any one of the programs may be obtained from the Office of Student Services.

Courses below the 500 level may not be applied toward the required credits needed for a post-baccalaureate degree, except for courses offered by the Duke Law School. Students wishing to take courses below the 500 level may do so but these courses do not count towards the degree nor can they be used to fulfill program requirements. Students must be enrolled in a full course load (at least 9.0 course credits for on-campus students) before adding a course below the 500 level. Students who choose to take a course below 500 may do so for a grade to demonstrate to a potential employer the extent of their knowledge acquired in a particular course, but the course will not count toward program or degree requirements.

Prerequisites

All programs require a semester each of college calculus and applied statistics as prerequisites. Most programs require additional prerequisites, as described later in this chapter. Any course submitted in fulfillment of a prerequisite should be taken for graded credit, a final grade of at least a C- must be earned and the course must be submitted on an official transcript from the accredited institution where the course was taken. Although not recommended, courses taken on a pass/fail grading basis, advanced placement credit and non-graded courses may be used to fulfill prerequisites.

Major (Core) Courses

Each program requires a series of core courses that provide essential background training relevant to the program’s objectives, as outlined in the program descriptions below.

Quantitative and Analytical Courses

All programs require 6.0 to 12.0 course credits stressing quantitative and analytical methods.

Elective Courses

Elective courses are available to give the student flexibility in developing their course of study. Most programs use some of these courses to add depth to the major area of study or to develop a second area of expertise. Students who select the Environmental Economics and Policy Program must use at least three of their elective courses to broaden their understanding of environmental science.

Master’s Project

A master’s project constituting 4.0 to 6.0 course credits is required. These projects take the form of individual or small-group analysis of a real-world environmental challenge, offering alternative recommendations for better management of the environment. Most master’s projects are conducted for a client. The results of the master’s project are presented orally in a symposium held near the end of each semester and in a written document that is presented to the student’s advisor before graduation and uploaded into a worldwide searchable database.

Seminars

All students are required to participate in seminars in their program area each semester that results in a total of one unit of credit at the end of their program. These seminars prepare students for the master’s project and other activities.

Certificates

Certificate programs allow students to achieve an area of special expertise by completing a series of courses and projects as a part of their overall degree program. At present, the Nicholas School offers certificates in geospatial analysis, climate change science and applications, and in community-based environmental management. In addition, Nicholas School students sometimes complete certificate programs in other schools or departments, such as the International Development Policy certificate offered by the Sanford School of Public Policy or the Latin American and Caribbean Studies certificate through the Duke Center for Latin American and Caribbean Studies.
Experiential Learning
The professional Master of Environmental Management (MEM), Master of Forestry (MF) and Duke Environmental Leadership (DEL-MEM) programs are applied and experiential in nature. As such, many courses will include field and/or travel activities that carry inherent risks. Such field and/or travel activities are an important component of the educational experience. Activities may include day or overnight trips to sites—such as forests, streams, mountains, beaches, coastal areas, islands, the ocean, urban or rural environments—to learn about and enjoy the outdoor world or to gain valuable practical, job-related experiences related to the student’s education. A description of the courses with travel components can be found at nicholas.duke.edu/academics/courses/travel-courses or nicholas.duke.edu/marinelab/academics/courses/travel-courses-marine-lab. Students are encouraged to review the websites above for more details regarding field trips and course related travel. Faculty will also provide information to students about field components for their courses during class. Participation in the travel component of some courses is mandatory to earn course credit. This will be noted in the syllabus or course description. Students should ensure they have a solid understanding of course expectations, risks and additional costs associated with travel and/or fieldwork before the end of the Drop/Add period so that they have time to consider the risks and take appropriate action as needed.

Students should inquire about possible restrictions to travel. Instructors will be aware of what types of travel are permitted.

Professional Skills Development
A modest matching fund is available to help students defray the cost of skills training offered outside the school, such as the certificate in nonprofit management offered by the Duke Continuing Studies department.
Concurrent Degrees

The most current information on all concurrent degree programs can be found at nicholas.duke.edu/academics/masters-programs/concurrent-degree-programs. In general, the Nicholas School works with the partner school to coordinate enrollments between the two schools. Students must apply to and be admitted by each school, and each school makes its own admission decisions. Typically, each school agrees to reduce by one semester the number of credits a student must earn, and the student agrees to tie the two degrees together so that the student may not earn one degree without the other.

Financial aid for concurrent degree students will be adjusted to take into account the reduction in required semesters of enrollment and credits needed. Students pursuing or interested in pursuing a concurrent degree should consult with the financial aid counselor for the Nicholas School for details particular to their specific concurrent degree program.

Master of Environmental Management and Master of Forestry

With careful planning of their curriculum, students can earn both the MEM and the MF degrees concurrently. The requirements for earning both degrees are as follows:

- The student must qualify for either the MEM or MF degree by earning 48.0 course credits under the requirements set forth in the previous section.
- For the second degree, the student must complete an additional 24.0 course credits of study that, in combination with courses taken for the first degree, meet the substance of the requirements for the second degree. Two additional semesters in residence are normally required, although, with careful planning, the student may complete both professional degrees in a total of five semesters.
- One master’s project should combine the two areas of study.

Determination of eligibility for the degrees will be made on an individual basis and will consider the educational background and objectives of the student.

Master of Business Administration

Students interested in a professional degree in environment and business at Duke have two options: 1) the Master of Environmental Management (MEM) degree in the Business and the Environment Program of the Nicholas School or 2) concurrent Master of Environmental Management or Master of Forestry/Master of Business Administration degrees (MEM or MF + MBA) from the Nicholas School of the Environment and the Fuqua School of Business. At least three years of study are required to earn the combined degrees of Master of Environmental Management/Master of Business Administration or Master of Forestry/Master of Business Administration. At least 36.0 course credits within the Nicholas School, recorded on the Nicholas School transcript, are required to receive the MEM or MF degree. Students are also required to fulfill the MEM master's project requirement by either reporting out on an applied or expanding on a project that they have already completed during their MBA degree. A typical program sequence would involve spending the first year in the Nicholas School followed by a year in the Fuqua School of Business and concluding with the final year of combined work in both schools.

These concurrent degrees stress analytical reasoning and management science, while providing the student with knowledge of current problems in the natural resources, energy systems, and sustainable business practices. The study of managerial, resource and energy economics, organization theory and management, strategy and natural resource management, the legal environment, and the public policy aspects of resource industries form a substantial component of each degree.

Because of the academic demands of these degrees, those entering without the necessary analytical skills or life science background may be required to take additional work beyond that specified.

Students who wish to undertake both the Master of Environmental Management or Master of Forestry and Master of Business Administration degrees must apply and be admitted by both the Nicholas School and the Fuqua School of Business. The Nicholas School will accept official GMAT scores from concurrent degree applicants who are applying as concurrent degree students. Students electing to pursue the MEM or MF concurrently with the MBA must complete the requirements for both degrees before either degree will be awarded. For information on the Master of Business Administration degree, the prospective student should visit fuqua.duke.edu.

The concurrent MEM/MBA or MF/MBA is also an option at the Nicholas School and the Kenan-Flagler School of Business at the University of North Carolina-Chapel Hill. The application and admissions processes are completely separate; applicants must meet Nicholas School requirements as well as requirements stated by Kenan-Flagler. The sequence of enrollment between the two schools differs slightly as well. Students considering pursuing the concurrent MEM/MBA at UNC should consult with a member of the Student Services team for additional details.
Detailed information on the MEM/MBA Program and requirements can be found at nicholas.duke.edu/academics/masters-programs/concurrent-degree-programs.

Master of Public Policy

Students interested in a professional degree in environmental policy at Duke have three options: 1) the Master of Environmental Management (MEM) degree in the Environmental Economics and Policy Program of the Nicholas School; 2) a Master of Public Policy (MPP) degree from the Sanford School of Public Policy; or 3) concurrent MEM/MPP (or MF/MPP) degrees from the Nicholas School and the Sanford School. Doctoral candidates in the Nicholas School are also eligible to undertake the Master of Public Policy.

The concurrent MEM (or MF)/MPP degree provides training in the politics and economics of resource and environmental policymaking. Emphasis is placed on understanding the social and political forces involved, developing facility with quantitative and logical methods of forecasting and evaluating policy consequences. Knowledge of the uses and limitations of policy analysis and an awareness of the ethical dimensions of policy choice are also stressed.

The concurrent degree takes three years to complete. Typically, the first year is devoted to study in the Sanford School of Public Policy, the second year is spent in the Nicholas School of the Environment and the third year combines work in both the Nicholas School and the Sanford School. At least 36.0 course credits within the Nicholas School, as recorded on the Nicholas School transcript, are required to earn the MEM or MF degree. A summer internship with a resource or environmental agency, or with a related legislative, judicial, or interest group, is required for the policy degree. Students in this concurrent degree program have the option of doing two separate master’s projects (MP), or one combined MP. Concurrent degree students working in a group MP in the Nicholas School must choose the two-MP option. Students electing to pursue the MEM (or MF) concurrently with the MPP must complete requirements for both degrees before either degree will be awarded.

Students must apply to and be accepted by both the Nicholas School of the Environment and the Sanford School of Public Policy. For detailed information on the public policy degree, write to the Director of Graduate Studies, Sanford School of Public Policy, Duke University, Box 90243, Durham, NC 27708-0243, or visit the Sanford School of Public Policy website at sanford.duke.edu.

Juris Doctor in Environmental Law

Environmental and natural resource issues increasingly require legal and regulatory knowledge for resolution. There is a growing demand for resource managers and scientists who have legal credentials; similarly, attorneys are facing more situations in which knowledge of natural resources and the environmental sciences is critical to the resolution of disputes. To satisfy these demands, the Nicholas School of the Environment and the Duke University School of Law have developed a cooperative arrangement to allow pursuit of concurrent Master of Environmental Management (or Master of Forestry) and Juris Doctor degrees.

For students in the concurrent MEM (or MF)/JD Program, the Nicholas School requires 36.0 course credits, including a master’s project. The School of Law requires 84.0 course credits in law, 12.0 course credits of which may be satisfied through courses taken in the Nicholas School.

Typically, a student will complete the first year of study in the Duke Law School and the second in the Nicholas School. During the third and fourth years, the student will take a combination of courses in both schools. Students electing to pursue the MEM concurrently with the JD must complete requirements for both degrees before either degree will be awarded.

MEM/JD candidates must apply to and be accepted by both the Nicholas School of the Environment and the Duke Law School. For information on the law degree, prospective students should write to the Duke University School of Law, Admissions Office, Duke University, Box 90393, Durham, NC 27708-0393, law.duke.edu.

Master of Arts in Teaching

Over the past several decades, international concern for protecting ecosystems has led to an increased need to educate citizens on the challenges facing the environment. Numerous education programs are now aimed at K-12 students as well as the general population. Environmental education is of increasing importance to those who prepare to teach, particularly in the sciences. Duke’s concurrent degree program between the Nicholas School of the Environment and The Graduate School allows students to meet this challenge by earning a Master of Environmental Management (MEM) and a Master of Arts in Teaching (MAT) degree.

In this concurrent degree program, to earn the MEM degree students must complete 36.0 course credits in the Nicholas School, including a master’s project. For the MAT degree, students will complete 30.0 course credits, including a full-year teaching internship and all requirements for the North Carolina teaching licensure in comprehensive science at the high school level. Competencies required by the state will be met through undergraduate courses taken prior to admission to Duke, science courses taken as part of the MAT or courses taken as part of the MEM.
Students will normally enroll in the MAT Program during the summer and then complete an academic year of student teaching and MAT coursework prior to enrolling in the MEM Program for three semesters. Students electing to pursue the MEM concurrently with the MAT must complete requirements for both degrees before either degree will be awarded.

Students must apply to and be accepted by both the Nicholas School of the Environment and The Graduate School of Duke University, citing the Master of Arts in Teaching Program. Students admitted to the MAT Program in comprehensive science must hold an undergraduate degree in one of the natural sciences with significant undergraduate preparation in biology and chemistry. Organic chemistry is required.

Questions concerning the MAT degree should be addressed to the Director of the Master of Arts in Teaching Program, (919) 684-4353, educationprogram.duke.edu/MAT.

Master of Engineering Management

Duke’s concurrent degree program between the Nicholas School of the Environment and the Pratt School of Engineering provides a broad perspective to blend the Master of Engineering Management (MEM) students’ engineering backgrounds and the Master of Environmental Management (or Master of Forestry) students’ training in natural and social environmental sciences, resulting in graduates with a strong mix of technical and contextual knowledge and tools well suited to careers in several environmental sectors, particularly energy and environment, environmental health, and water resources. Students wishing to pursue the MEM in a concurrent arrangement with the MEMP should plan on two to three years of study.

Students must complete 36.0 course credits in the Nicholas School, including a master’s project. An additional 24.0 course credits must be taken in the Pratt School of Engineering, including a required summer internship.

Prior to enrolling in the fall, students fulfill their required engineering internship in the summer preceding the fall term. During the first year, courses are split evenly between engineering and environment with an emphasis on core engineering courses. The second year includes elective credits in the Pratt School of Engineering and key core courses in the Nicholas School. During the third year students will complete their master’s projects for the Nicholas School; they may be able to finish in one additional semester or may require the full year to complete remaining credits and the master’s project.

Students must apply to and be accepted by both the Nicholas School of the Environment and the Pratt School of Engineering. Students electing to pursue the MEM or MF concurrently with the MEMP must complete requirements for both degrees before either degree will be awarded. Questions concerning the MEM should be addressed to the Master of Engineering Management Program, Phone: (919) 660-5455; pratt.duke.edu/grad/masters.

Concurrent Degrees with Other Universities

With the special permission of the education committee and the dean of the Nicholas School of the Environment, students are permitted, on an individual basis, to establish concurrent degree programs with certified graduate degree programs either within or outside of Duke University. In the past, students have designed such programs with law schools, business schools, and graduate engineering programs. As with the other concurrent degrees, the student must be enrolled in the Master of Environmental Management or Master of Forestry degree program for at least 36.0 course credits and be in residence for three semesters.

To receive permission to pursue a specially designed concurrent degree, the student must show an official acceptance from another certified graduate degree program. For additional information concerning special concurrent degrees, applicants should consult the Nicholas School Office of Student Services.
Admissions
Requirements and Prerequisites

The Nicholas School of the Environment welcomes applications from domestic and international students of all backgrounds who seek an intellectually challenging education designed to prepare them for leadership in a wide variety of natural resource and environmental careers. Admission to the Master of Environmental Management (MEM) and the Master of Forestry (MF) is open to students who hold a four-year equivalent bachelor's degree from an accredited college or university. Admission as a nondegree student may also be granted under appropriate circumstances.

Students enrolled in the Duke Environmental Leadership Master of Environmental Management (DEL-MEM) Program are subject to the same requirements, responsibilities, and policies as set forth for on-campus MEM students, except where specifically differentiated (i.e., admissions requirements, credit requirements, program format, and curriculum requirements). Admission to the DEL-MEM is open to students who hold a bachelor's degree from an accredited college or university and have a minimum of five years of post-degree environmentally-related experience (professional or a significant commitment to the personal/volunteer work in related fields). The DEL-MEM Program is a thirty-course-credit, two-year, four-semester Master of Environmental Management degree-granting program utilizing distance-learning technologies.

For information about the International Master of Environmental Policy (iMEP), see here.

Prerequisites

All students admitted to the Nicholas School are expected to have had the following (except the DEL-MEM program, see below):

- some previous training in the natural sciences or the social sciences related to their area of interest in natural resources and environment;
- at least one college semester of calculus; and
- a college statistics course that includes descriptive statistics, probability distributions, hypothesis testing, confidence intervals, correlation, and simple linear regression.

Each program area requires additional courses or recommends additional preparation, as follows:

- **Business and Environment**: microeconomics (or general economics that focuses on microeconomics)
- **Coastal Environmental Management**: microeconomics (or general economics that focuses on microeconomics)
- **Ecosystem Science and Conservation**: principles of ecology; microeconomics (or general economics that focuses on microeconomics) recommended
- **Ecotoxicology and Environmental Health**: chemistry; principles of ecology and organic chemistry recommended
- **Energy and Environment**: microeconomics (or general economics that focuses on microeconomics)
- **Environmental Economics and Policy**: microeconomics (or general economics that focuses on microeconomics)
- **Forest Resource Management**: microeconomics (or general economics that focuses on microeconomics); principles of ecology
- **Water Resources Management**: Microeconomics; chemistry, and physics recommended
- **Duke Environmental Leadership Program**: minimum of five years of post-degree environmentally-related experience (professional or a significant commitment to personal/volunteer work in related fields)

All programs (except DEL-MEM) require a semester each of college calculus and applied statistics as prerequisites. Most programs require additional prerequisites, as described later in this chapter. Any course submitted in fulfillment of a prerequisite should be taken for graded credit, a final grade of at least a C- must be earned and the course must be submitted on an official transcript from the accredited institution where the course was taken. Although not recommended, courses taken on the pass/fail grading basis, advanced placement credit and non-graded courses may be used to fulfill prerequisites.

Although students lacking the level of preparation described above may be admitted, deficiencies should be made up prior to enrollment in the Nicholas School. It is especially important for concurrent degree students and students planning to study at the Duke University Marine Laboratory in their second year to complete all prerequisites prior to enrollment. A student may enroll missing a maximum of one prerequisite course, which must be made up during the first year of study; however, a course taken to fulfill a prerequisite will not count towards the 48 course credits required for the MEM or MF degree and could delay the student's progress toward the degree.

Recruitment, Campus Visitation, and Interviews
Duke University

Each year, representatives of the Nicholas School recruit prospective students through a range of in-person and virtual opportunities, including but not limited to virtual admissions information sessions, graduate school and career fairs, and professional conferences. Due to ongoing effects of the COVID-19 pandemic, off-campus recruitment will be limited.

Prospective students may view upcoming recruitment events, request further information about the DEL-MEM, MEM, and MF programs, and sign up for application process updates from the Nicholas School of the Environment by visiting nicholas.duke.edu/admissions/connect-with-us.

While campus visits are neither required nor considered as a factor for admission to the Nicholas School, prospective students who are able to travel to Durham may find them helpful and informative. Campus visits occur during the academic year when classes are in session (i.e. during the fall and spring semesters), and visitors select from pre-scheduled week days. Visit registration includes the option to customize the visit day from a list of pre-scheduled activities, such as touring NSOE facilities, meeting with NSOE staff and a class visit (subject to staff and faculty availability). Due to ongoing effects of the COVID-19 pandemic, campus visitation may be limited. Virtual tours of the Durham campus and the Duke University Marine Lab are also available. Interested students may learn more about virtual and in-person campus tours by visiting nicholas.duke.edu/admissions/visit-or-virtual-tour.

An interview with a member of the admissions committee is not required for admission to the on-campus MEM or MF programs. Applicants to the DEL-MEM program are required to participate in an interview, if requested by the admissions committee.

Admissions Criteria

Admissions criteria for the Nicholas School of the Environment are designed to ensure that admitted students will perform well while they are at Duke and after they graduate. The Admissions and Awards Committee evaluates each candidate holistically for their academic potential, professional promise and ability to benefit from and contribute to the goals of the school. Academic performance as an undergraduate and work experience are key factors considered in the application review process alongside letters of recommendation, the applicant’s personal statement, résumé, and other information required on the application.

Individuals with prior relevant work experience are especially encouraged to apply. The admissions criteria for the DEL-MEM Program include a minimum of five years of post-degree environmentally-related experience (professional or a significant commitment to the personal/volunteer work in related fields). Academic performance as an undergraduate, professional environmental work experience, leadership experience and/or potential, letters of recommendation, applicant essays, and an applicant interview (for DEL-MEM) are the primary factors considered in the application review process. Extracurricular activities and other information requested on the application also provide a basis for selection.

Application Procedures

Application for admission to the on-campus Master of Environmental Management and the Master of Forestry degrees and the DEL-MEM is made through the Office of Student Services of the Nicholas School of the Environment by submitting an electronic application and electronic upload of supporting documents (see details below).

For the on-campus MEM, MF, and the DEL-MEM, the application deadline is January 15 preceding the fall in which admission is desired. Admission is offered for the fall term only. Applications received after the January 15 deadline may be considered on a space-available basis after all on-time applications have been considered. All applications for admission are also considered for a limited number of merit-based financial awards; merit-based financial assistance is not guaranteed.

Application instructions and the link to the online application are available by visiting nicholas.duke.edu/admissions/how-apply. No applicant will be considered until the completed application form and all required documents described below are received and processed by the Office of Student Services.

1. Application Form. The electronic application may be accessed through the Nicholas School website, nicholas.duke.edu/admissions. Both on-campus MEM and MF as well as DEL-MEM applicants should use the above link. The Admissions and Awards Committee attaches considerable weight to the statement of educational objectives submitted by the applicant. This statement should reflect well-defined motivation to pursue graduate study. Applications to the PhD program are available through The Graduate School website.

2. Official Transcripts. One copy of the transcript from each undergraduate and graduate school attended should be uploaded electronically as part of the electronic application. Unofficial transcripts are acceptable for the application review process. Official transcripts showing awarding of the degree must be submitted by every matriculating student prior to enrolling. Paper transcripts may be sent to the Office of Student Services, Nicholas School of the Environment, Duke University, Box 90328, Durham, NC 27708-0328 in sealed envelopes that have been signed across the flap by the registrar of the institution attended. If the original transcript is not in English, the applicant must also provide a certified English translation. If not included on the
Duke University

transcript, students must provide proof of the degree prior to enrollment. If the institution uses SCRIP-SAFE International (or similar agent) for the delivery of official transcripts, the applicant may request that their registrar forward an official transcript to admissions@nicholas.duke.edu.

3. **Application Essay(s).** Applicants are required to submit one or more application essays as outlined in the application instructions on the NSOE website.

4. **Letters of Recommendation.** Each applicant is required to submit three letters of recommendation, electronically.

5. **Graduate Record Examination (GRE) scores.** Please check the Nicholas School website to determine if official GRE scores will be required.

6. **Application Fee.** Please verify with Admissions regarding the application fee.

**Additional Procedures for International Students**

Each year the Nicholas School of the Environment welcomes a number of international students among its professional degree candidates, including the Duke Environmental Leadership program. All applicants must meet the same criteria for admission, including a four-year bachelor’s degree or its equivalent. All academic transcripts and other documents in support of admission must be provided in English (we respectfully request an official translation for documents not originally written in English). The nonrefundable application fee must accompany the application.

**English Language Proficiency**

Applicants whose first language is not English must submit an official score on the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS) exam or the Duolingo English Test. This requirement is waived if the applicant earned their undergraduate degree in the United States, earned an undergraduate or master’s degree from an English-only speaking institution, or has been working in the United States for two years or more. The Nicholas School does not set minimum required scores; if an applicant’s score is low, they may be accepted on the provision that they complete an intensive English language program in the United States prior to the start of the program.

- **Test of English as a Foreign Language (TOEFL), ets.org/toefl.** Official TOEFL scores should be reported to Duke University’s institution code 5156; there is no department code.
- **International English Language Testing System (IELTS), ielts.org**
  - Applicants must contact the IELTS test center where they took the test to request official test results be sent to the address below. An institution code is not required.
  - Official IELTS scores should be sent via e-delivery using the following information:
    - Institution: Duke University Nicholas School of the Environment
    - Address: 9 Circuit Drive, Box 90328, Durham, NC 27708
  - A pdf of IELTS score reports should be uploaded in the “Supplemental Uploads” section of the application. Scores will be considered unofficial until the Enrollment Services team verifies your scores through the testing service.
- **Duolingo: englishtest.duolingo.com**
  - There is no institutional code for Duolingo, but applicants will need to select “Duke University Graduate Programs: Graduate School; Divinity; Engineering; Environment; Public Policy; Duke Kunshan” at the “Graduate” program type level as the institution to send scores to.
  - Make sure to include subscores when you select your institution. Score reports without subscores will not be accepted. If you are not sure how to include subscores in your score report, please contact Duolingo English Test support on the Duolingo English Test website.

**Additional note for the on-campus Master of Environmental Management and Master of Forestry.** All non-native English speakers will be required to take proficiency exams in written and spoken English during orientation week; depending on these results, the student may be required to enroll in additional English language instruction. Students may count one English course as a general elective towards their degree. If the student takes additional English courses, they will not count towards their MEM or MF degree. Students should be prepared to assume all costs for any required English course and may need to reduce their course or research work while being enrolled in English language instruction.

**Proof of Funding**

The visa-granting authority in the student’s country of origin, ordinarily the United States Embassy, requires proof that sufficient funds are available to the student to cover the expenses of study before a visa can be granted. International students are not eligible for federal and state loans, although they may qualify for certain educational loans through private United States agencies. Labor and visa
policies might limit the eligibility for non-US citizens to pursue summer employment and permanent employment in the United States after graduation. Merit-based financial assistance, if it is offered, is not sufficient to cover all costs associated with studying at the Nicholas School. International students should expect to demonstrate other sources of support to meet regulatory requirements and obtain a visa.

**DEL-MEM Visa Requirements for Non-US Citizens**

If admitted, the DEL-MEM program requires students to participate in five (5) place-based sessions. Four of these sessions take place at Duke University in Durham, NC, and one place-based session is held in Washington, DC. Duke University and the US Department of Homeland Security require non-US citizens entering the United States to participate in the DEL-MEM program place-based sessions to enter the United States on an F-1 student visa for each place-based session. A business or tourist visa is not sufficient.

**Admission with Nondegree Status**

Persons wishing to enter the Nicholas School of the Environment as nondegree students must submit a special application form requesting nondegree status along with an application fee of $25. The applicant must have completed a bachelor’s degree from an accredited college or university and must submit an official transcript of all previous coursework. Taking the Graduate Record Examination is not required. The student must have one letter of recommendation; this letter should indicate why the applicant should be allowed to undertake nondegree study at Duke. The application itself requires a brief statement of purpose in which the applicant should state their reasons for such study at Duke.

Admission as a nondegree student does not guarantee future admission to the MEM or MF degree. Nondegree students who complete an application for the professional degree and are offered admission may be able to count a limited number of appropriate credits from their nondegree status at Duke toward the MEM or MF degree. The student’s program chair will determine which if any credits may be counted toward the degree. Applying credits taken as a nondegree student does not reduce the number of semesters required for the degree or the tuition required. Neither the on-campus nor the DEL-MEM programs accept transfer credits from other institutions.

**Notification of Admission Decisions**

After the Admissions and Awards Committee has complete review of all applicants for the upcoming fall semester, applicants will be notified via email that their decision is available to view by logging into their applicant portal. Hard copy letters are not sent; students may save a PDF of their decision letter from within their applicant portal for their own records. Admission decisions for all applicants will be released in mid-March.

Students who are offered admission and who intend to enroll must formally accept the offer of admission via an electronic admissions reply form and submit a nonrefundable enrollment deposit by the posted enrollment deposit deadline. Instructions for doing so and the deadline are included in the applicant’s decision letter. Students who are offered admission who do not intend to enroll are encouraged to complete the electronic admissions reply form to decline their offer of admission. Failure to respond by the stated deadline may result in withdrawal of the application. Notification of any merit-based financial awards and Financial Aid Award Notices (FAAN) will be sent to admitted students within a few weeks of admission; FAANs include federal loans for which the student may be eligible.

Students may be offered a place on a waiting list, and must accept or decline via an electronic reply form by the deadline noted in their decision letter. Should space be available after the initial enrollment deposit deadline for admitted students, students who accept a place on the waiting list will be considered for admission. All students who accept a place on the waiting list receive a final decision by the end of June.

**Deferred Admission**

Applicants are admitted only to the class for which they have applied and should not apply until they are prepared to undertake professional studies. Deferrals will be granted for Teach for America, Peace Corps, AmeriCorps, City Year and military service. Deferrals are granted for one year (next fall admission cycle). Students interested in requesting a deferral should contact the Office of Student Services via email as soon as possible after receiving their admissions decision at nicholas-admissions@duke.edu. Approved deferral requests require receipt of a tuition deposit; should the student choose not to matriculate, they will forfeit their deposit and be required to reapply for future admission consideration. Any financial aid awards will be canceled and re-evaluated alongside the next admitted student class, and a new application for need-based financial aid will be required.
Tuition & Fees

Estimated Expenses for the Academic Year

The following approximate costs, applicable in 2022-2023, are indicative of costs that can be expected by MEM and MF candidates; PhD students should consult the bulletin of The Graduate School for similar data. Students should expect that tuition and fees will increase annually; the amounts are determined by the school and the university and reviewed and approved by the Board of Trustees.

<table>
<thead>
<tr>
<th></th>
<th>ON-CAMPUS</th>
<th>DEL-MEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition</td>
<td>$42,750</td>
<td>$42,750</td>
</tr>
<tr>
<td>Student health fee</td>
<td>$900</td>
<td>-</td>
</tr>
<tr>
<td>Graduate student activity fee</td>
<td>$38</td>
<td>-</td>
</tr>
<tr>
<td>Recreation fee</td>
<td>$342</td>
<td>-</td>
</tr>
<tr>
<td>Graduate student services fee</td>
<td>$22</td>
<td>-</td>
</tr>
<tr>
<td>Transcript fee (first semester only)</td>
<td>$120</td>
<td>$120</td>
</tr>
<tr>
<td>Housing</td>
<td>$10,440</td>
<td>-</td>
</tr>
<tr>
<td>Food</td>
<td>$3,556</td>
<td>$3,556</td>
</tr>
<tr>
<td>Books and supplies</td>
<td>$668</td>
<td>$668</td>
</tr>
<tr>
<td>Transportation</td>
<td>$1,782</td>
<td>$1,782</td>
</tr>
<tr>
<td>Motor vehicle registration and parking</td>
<td>$200-$1,257</td>
<td>-</td>
</tr>
<tr>
<td>DEL-MEM Place-based Sessions Associated Costs (food, lodging, transportation)</td>
<td>-</td>
<td>$8,186</td>
</tr>
</tbody>
</table>

In addition to these fixed expenses, the student may incur other expenses, which will depend to a large extent upon individual tastes and habits. All on-campus students are required to carry major health insurance either through Duke’s comprehensive medical insurance plan or by providing proof that other health insurance provides comparable coverage. International students are required to purchase Duke’s student medical insurance plan. The average Duke Nicholas School student can plan on a budget in the range of $68,000 to $70,000 for the academic year. Students with spouses and children should expect to have higher expenses.

Specific tuition information for the Duke Environmental Leadership program can be found at nicholas.duke.edu/admissions/tuition-fees.

Flat-Rate Tuition

Professional degree students in the Nicholas School pay a flat rate of tuition per semester (excluding the summer session) (see Flat-Rate Tuition—Duke Environmental Leadership Program below for the DEL-MEM Program). Students enrolled in the regular two-year MEM or MF degree program are required to pay the flat rate tuition for a minimum of four semesters. Students in concurrent degree programs at Duke pay a flat rate to the university throughout their concurrent degree program that is split proportionately between the two programs regardless of where the student is taking courses in a particular semester; the tuition rate for the Nicholas School is equivalent to three semesters. Students in the concurrent MEM/MF program must enroll full-time for at least five semesters and pay the flat-rate tuition for a minimum of five semesters.

The flat-rate tuition allows Master of Environmental Management and Master of Forestry degree candidates to register for 9 or more course credits for a fixed tuition payment per semester. The normal full-time enrollment is expected to be 12 course credits per semester, although course credits may vary from 9 to 16.5 depending upon the student’s academic and assistantship requirements. Permission is required to register for fewer than 9 or more than 16.5 course credits in a semester.

If the student is permitted to be enrolled part time (fewer than 9 course credits), they will be charged per course credit ($1,943 per unit for the 2022-2023 academic year). Students who are approved for part-time enrollment status are not eligible for school or federal financial aid. The per credit rate is available to professional degree students only after the minimum number of semesters of tuition have been paid (three, four, or five semesters depending on the degree program/s).

Students who wish to earn additional credits during the summer will be charged at the part-time rate per course credit. Payment for summer session courses is in addition to the required four semesters at the flat tuition rate. Students who have completed the required semesters in residence and all course requirements except the master’s project will be charged a minimum registration fee ($400 for 2022-2023) each semester until the degree is completed. Students being paid for a summer internship may not receive academic credit in addition to the salary.
All students are expected to be registered in residence, to be approved for a leave of absence or to pay a minimum registration fee for each semester until their degree is completed.

**Flat-Rate Tuition—Duke Environmental Leadership Program**

Professional degree students in the Nicholas School DEL-MEM Program pay a flat rate of tuition per semester (excluding the summer session) for four semesters.

The DEL-MEM Program is a minimum thirty-course-credit program that must be completed in four semesters over two years. The flat-rate tuition allows Master of Environmental Management degree candidates to register for courses for a fixed tuition payment per semester. To complete the DEL-MEM Program within the required amount of time, students typically take between 6 and 9 course credits per semester. Permission is required to register for fewer than 6 course credits or more than 12 course credits in a semester. Students must be enrolled with at least 6 course credits to be considered a full-time student and to receive federal financial aid, if eligible. Students registering for fewer than 6 course credits per semester are not eligible to receive federal financial aid.

Students who have completed the required four semesters and all course requirements, except the master’s project, will be charged a minimum registration fee ($400 for 2022-2023) each semester until the degree is completed.

All students are expected to be registered, to be approved for a leave of absence, or to pay a minimum registration fee for each semester until their degree is completed.

**Tuition Policies**

**Payment of Accounts**

Invoices for tuition, fees, and other charges are sent electronically by the Office of the Bursar and are payable by the invoice due date. As a part of the agreement of admission to Duke University, a student is required to pay all invoices as presented, unless other arrangements are made in advance. Students interested in arranging a payment plan should review the information at the Bursar’s website: finance.duke.edu/bursar/Payments#monthly.

**Late Payment Charge**

If the total amount due on the student invoice is not received by the invoice due date, a penalty charge will be accrued from the billing date and applied to the past due balance. The past due balance is defined as the previous balance less any payments and credits received during the current month. Student loan payments already accepted and in process in the system will not cause a late payment charge.

**Restrictions**

If the total amount due on the student invoice is not received by the due date, the student will be considered in default and will not be allowed to register for classes, receive a copy of the academic transcript, have academic credits certified, be granted a leave of absence or receive a diploma at graduation. In addition, an individual in default may be subject to dismissal from the university.

**Tuition Refund Policy**

In case of withdrawal from the university, Title IV federal financial aid received by students enrolled for the first time at Duke will be refunded on a pro rata basis. The pro rata formula is calculated by multiplying the total school charges by the remaining fraction of the enrollment period for which the student has been charged, rounded downward to the nearest 10 percent, less any unpaid charges owed by the student. The pro rata refund policy does not apply to any student whose withdrawal occurs after the 60 percent point in the period of enrollment. Sample refund calculations are available from the Student Services office.

If the student receives federal financial aid but is not attending the university for the first time or if the student does not receive federal financial aid, tuition will be refunded or carried forward as a credit for later study according to the following schedule:

<table>
<thead>
<tr>
<th>Withdrawal</th>
<th>Refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before classes begin</td>
<td>full amount</td>
</tr>
<tr>
<td>During first or second week</td>
<td>80%</td>
</tr>
<tr>
<td>During third, fourth or fifth week</td>
<td>60%</td>
</tr>
<tr>
<td>During sixth week</td>
<td>20%</td>
</tr>
<tr>
<td>After sixth week</td>
<td>none</td>
</tr>
</tbody>
</table>
School-based financial aid will be cancelled if a student withdraws from the university. Doing so could leave an outstanding balance on the student's account that would need to be paid by the student. Should the student reapply for admission at a later time school-based aid is not guaranteed. Students will be considered in the pool with other students admitted for that term.

Late Registration
Students who register at a date later than that prescribed by the university must pay a late registration fee at the Office of the Bursar.

Audit Fee
Students registered for a full course load may audit courses without charge. Otherwise, audit fees are $680 per course credit.

Transcripts
Official transcripts are available upon request from the Duke University Office of the University Registrar. During their first semester in residence, students are charged a fee that covers all future requests for official transcripts. The Nicholas School of the Environment cannot issue official transcripts. Current students may order transcripts through DukeHub. For more information, visit registrar.duke.edu/student-records-resources/transcripts-and-verifications.

Student Health Fee
All students are assessed a fee for the Student Health Service. This fee is distinct from health insurance and does not provide major medical coverage.

Medical Insurance
All on-campus students are billed for major medical/health insurance in the fall semester unless proof of other insurance is provided. Family plans are available through the university's insurance vendor for an additional fee. All international students will be registered automatically for the Duke Student Medical Insurance policy. International students are required to carry health insurance for a spouse or children living in Durham.

Students enrolled in the DEL-MEM Program are exempt from the health insurance fee. However, DEL-MEM students opting to enroll in the Duke health insurance plan can do so by contacting the university's insurance vendor.

Tuition and Fees for the Summer
MEM and MF students who wish to take additional credits during the summer should expect to do so through other departments in the university or at the Duke University Marine Laboratory in Beaufort. Students should consult with their advisors to make sure the courses are appropriate for their program of study. Tuition and fees for summer study depend on the department. Students choosing to study at the Marine Lab during the summer are still required to pay four full semesters of tuition and be in residence for at least three semesters in the pursuit of their degree. Information on fees, housing, policies, and procedures related to the Duke University summer session is available at summersession.duke.edu.

Summer session coursework cannot be considered a substitute for the required semesters in residence during the academic year, nor does it reduce the flat rate tuition for the academic year. DEL-MEM students wishing to study during the summer at the Marine Lab may submit a request to the DEL faculty program director for permission. DEL-MEM students who are given permission to take summer courses at the Marine Lab are still obligated to be enrolled full-time for four semesters and pay four semesters of full-time tuition in addition to any tuition and fees required at the Marine Lab.

Students wishing to take courses at other institutions through the Interinstitutional Agreement must be enrolled in the same number or more credits at Duke during the same summer term.

Recreation Fee
A mandatory fee will be charged to all registered students for usage of campus recreational facilities. Students' spouses or domestic partners are eligible to use the facilities for an additional fee. Students enrolled in the DEL-MEM Program are not assessed this fee. Local DEL-MEM students wishing to use campus recreational facilities may do so for a fee.

Debts
Students are expected to meet all financial obligations to the university prior to completion of the degree. Failure to pay all university charges by the due dates specified by the university will bar the student from registration, class attendance, receipt of transcripts, certification of credits, leave of absence, or graduation until the account is settled in full. Further, an individual in default may be subject
to dismissal from the university.
Financial Assistance

Financial assistance in the form of merit-based scholarships, fellowships, or assistantships is available for qualified students. Funds to support these merit awards are limited. As a result, students must have other financial resources. For many students, the federal loan programs provide a large portion of the funds necessary to cover the cost of attendance. Students in the DEL-MEM Program may also be eligible for limited financial support from the school.

All professional degree students who are US citizens or permanent residents must file the Free Application for Federal Student Aid (FAFSA) to be considered for student loans and work-study. A separate application must be filed for each academic year. Applicants may obtain a FAFSA online at studentaid.gov. The report should be sent to Duke University code 002920. Professional degree applicants must also complete the financial aid section of the Application for Admission.

Scholarships and assistantships are granted from school funds, which are in limited supply. Consequently, only highly qualified students can expect to receive awards. Scholarships and assistantships are awarded on the basis of a combination of demonstrated outstanding academic ability, diverse perspectives and experiences, and demonstrated professional promise.

Fellowships are obtained from foundation grants, private industry, or individual donors. Donors of fellowship funds sometimes place restrictions on the use of the funds as well as on the amount of awards.

Research assistantships are obtained primarily from grant and contract funds awarded to various faculty in the school. University-funded assistantships may be available for students who have sufficient experience to contribute to one or more ongoing research or academic programs. Assistantships awarded by the Nicholas School do not carry any sort of tuition waiver or stipend.

Pursuant to the Tax Reform Act of 1986, students performing any services (whether degree-related or not) required by their scholarship, fellowship, or assistantship must have income taxes withheld. However, if the student anticipates no tax liability at the end of the calendar year, they can note “exempt” on the state and federal withholding forms, and no taxes will be withheld. Income tax information is reported to the student by the university in January.

In all instances, admission to the Nicholas School is a prerequisite for the award of assistance in any form. If offered financial assistance, professional degree students typically receive the award for two years of study; it is expected that they will complete their degree within this period of time. The school has the right to examine the progress of each student to determine eligibility for continuation of awards beyond the first year. Students not in good standing (with regard to academics or honor code) are not eligible for any new awards from the Nicholas School (e.g., scholarships, fellowships, recognitions without monetary component) whether academic performance is an eligibility criterion or not.

No student will receive financial aid while on probation unless an appeal is approved by the associate dean for professional programs and the assistant dean for student services.

Financing Aid for Concurrent Degree Students

NSOE students in a concurrent degree program with another Duke program will have an adjustment made to their NSOE tuition charge to a new blended tuition rate, as well as an adjustment in their NSOE financial aid award. Students in a concurrent degree program will be charged the equivalent of three semesters of tuition; similarly, concurrent degree students who have been offered school-based aid will receive the equivalent of three semesters of aid.

Students pursuing a concurrent degree with a non-Duke program are obligated to three semesters of enrollment and payment of three semesters of tuition and fees. School-based aid offered at the time of admission will be awarded for three semesters to coincide with the three semesters in which the student is enrolled at Duke.

In all cases, students pursuing or considering pursuing a concurrent degree must complete the survey found at the Nicholas School website, nicholas.duke.edu/about/policies/financial-aid-policy-concurrent-degree-students and meet with the school’s financial aid counselor before October 15 of their first year at Duke, regardless of where they begin their concurrent degree program.

Eligibility for Financial Assistance

A significant portion of the financial assistance for students in the Nicholas School of the Environment is provided by federal, Title IV funds. To qualify for such funding, usually in the form of loans, students must meet federal eligibility requirements including the maintenance of satisfactory academic progress (see Satisfactory Academic Progress section in Academic Regulations). Professional degree students must meet satisfactory academic progress standards to maintain eligibility for Title IV funds.
Although professional degree students, including DEL-MEM students, have five years from the first date of matriculation in the school to complete their degree requirements, they are eligible for federal financial assistance for the equivalent of four full-time semesters only. Students who fail to meet the satisfactory academic progress requirements or need federal financial assistance for more than the equivalent of four semesters may appeal to the Admissions and Awards Committee.

**Assistantships**

Merit-based assistantships may be awarded to a select number of professional degree on-campus MEM and MF students during their first year of study to assist faculty and staff with teaching, research, professional, and other projects. It is expected that students will work for eight hours a week on their assigned project. Assistantships require a regular work schedule to be arranged between the student and the faculty or staff member to whom they are assigned. Students receiving an assistantship will be informed of the positions available, application, interview and assignment process just prior to the start of the fall term. Students who receive assistantships are paid by the Nicholas School on the monthly payroll, and taxes are taken out. For the 2022-2023 academic year, the award for eight hours per week of assistance is $3,000 gross. Normally, assistantships are available only for the academic year and require full-time enrollment in the school. If a student completes the assistantship in full, is in good academic standing and returns to full-time enrollment in the Nicholas School for their second year in 2023-2024, the student will receive the assistantship funds as scholarship applied directly to their bursar account toward their tuition for the second year.

**Need-Based Grants**

The Nicholas School reserves a limited amount of financial aid for students with significant financial need. Both domestic and international students in the on-campus MEM, MF, and DEL-MEM degrees may apply for need-based aid. There is a separate required application process in order for a student to be considered for a need-based grant. The Nicholas School uses College Board (CSSProfile and IDOC) services for students to submit their applications. For students entering in the fall, the deadline for completing an application for need-based aid is February 17, 2023 for Fall 2023. Parental asset and income information is required as part of the application for a need-based grant. Additional details regarding the application process may be found at the Nicholas School website, nicholas.duke.edu/admissions/financial-support-aid. In order to receive the same need-based grant in their second year, students must be enrolled full-time in the Nicholas School in good standing, affirm that their financial situation has not improved by the end of their first year and they must be returning to full-time enrollment in the Nicholas School for their second year in 2023-2024.

**Work-Study**

Work-study funds for professional degree students are administered through the Office of Student Services. At the beginning of the academic year, students are made aware of work-study opportunities and informed of the application procedures. Interested students must file the Free Application for Federal Student Aid (FAFSA) in order to determine eligibility. Because the FAFSA is available only to US citizens and permanent residents, work/study funds are not available for F-1 and J-1 students. Some on-campus jobs may not require work/study funding but many will require it. Currently, students enrolled in the DEL-MEM Program are not eligible for work-study funds.

**Application for Awards for the Entering Student**

Students wishing to be considered for merit-based scholarships must submit a complete application no later than January 15 preceding the fall for which admission is desired. Applications received after January 15 will be considered for merit-based assistance only if funds remain after considering all on-time applications. Applicants should initiate the necessary action early to ensure that the required documents are filed with the school’s Office of Student Services on or before January 15 to be assured of equal consideration for financial aid. Completed applications received after the January 15 deadline will be considered if vacancies occur at a later date.

**Notification and Acceptance of Awards**

Applicants who submit completed applications by January 15 and are subsequently offered admission will be notified soon after admission regarding merit-based aid. Once offered by the university or the school, funds are committed to one student and are therefore unavailable to others. As a consequence, it is the policy of the Nicholas School that all awards offered may be declined prior to May 1 without prejudice. However, offers accepted and left in effect after May 1 are binding for both the student and the school.

**Loans**

Federally insured student loans are often necessary and useful in helping a student afford the graduate program of their choice. Students considering federal loans should consider the nature of the loan and the positive and negative aspects of future loan payments and should also investigate all other forms of financial assistance.

Federal law requires all students to have completed a Free Application for Federal Student Aid (FAFSA) to determine financial need. The
FAFSA form may be obtained online at studentaid.gov or by contacting a college or university financial aid office or the Office of Student Services. No loan application will be processed without the FAFSA form having been submitted to the central processor. In addition, in some cases federal law requires verification of income and other information.

Federal Direct Unsubsidized Loans

Federal Direct Unsubsidized loans of up to $20,500 are available for eligible graduate/professional students. For loans made to new borrowers, interest is calculated at a fixed annual rate of 6.54 percent for the 2022-2023 academic year. Interest on unsubsidized loans must be paid by the student during enrollment or capitalized to the principal at the borrower’s request. A loan origination fee of approximately 1.057 percent will be charged and will be deducted before the loan disburses.

Students who borrow through the federal direct unsubsidized program will be given entrance and exit interviews concerning the projected and actual costs of their loans. They will also be provided with information on loan consolidation should this repayment option be desired or needed.

Graduate Plus Loan Information

The Deficit Reduction Act of 2005 allows graduate and professional students to borrow under the Federal PLUS loan program beginning with the 2006-07 aid year. The PLUS (Parent Loan for Undergraduate Students) was previously available only to the parents of dependent undergraduate students. Beginning July 1, 2006, that availability was expanded to graduate/professional students.

Students must be graduate/professional students enrolled at least half-time in a matriculated program; they must complete a current FAFSA; they must first apply for the maximum loan eligibility in Federal Unsubsidized loan before the PLUS can be awarded; parents of graduate students will not be eligible to borrow the loan.

PLUS Loan borrowers are required to pass a basic credit check. The borrower may borrow the difference between the total cost of the student’s education (including books, fees, and personal expenses) minus any financial aid the student will receive. The interest rate on the PLUS loan is 7.54 percent for the 2022-2023 academic year.

Repayment begins within sixty days after the final disbursement of each loan. The maximum repayment period is ten years, and the minimum monthly payment is $50. Students may be eligible to defer payments as long as they maintain at least half-time enrollment. A loan fee of approximately 4.228 percent will be charged and will be deducted proportionately prior to each loan disbursement. In addition, some loan guarantee agencies charge a 1 percent guarantee fee, which will also be deducted from disbursements.

Fellowships for MEM/MF Students

Merit-based awards depend on the generosity of donors. Students receiving merit-based awards may be supported from one of the following endowments.

Alumni Fellowship. Established by graduates of the Nicholas School, the Alumni Fellowship Endowment provides fellowships to minority students and to rising second-year students to support master’s project research.

Lawrence E. Blanchard Society of Scholars and Fellows. Established by Charles and Bernard Blanchard, this fund provides scholarships to undergraduates and fellowships to graduate students studying at the Duke University Marine Laboratory.

Norman L. Christensen Jr. Fellowship. This fellowship was established by Duke and Nicholas School alumni and friends in honor of the founding dean of the Nicholas School, Dr. Christensen.

William Cleveland Fellowship. Established by William Cleveland, this fellowship provides financial assistance to Nicholas School students.

The Creem Scholarship Fund. This fund was established to support Master of Forestry students.

Cummings Family Fellowship. Established by Bruce and Myrna Cummings, this fellowship supports Nicholas School students.

Barbara L. Dannenberg Fellowship. Established by Richard Dannenberg, this fellowship is for Nicholas School students with a preference for the field of ecology.

Kathryn M. Deane and Walter L. Deane Fellowship. Established by Walter Deane and Kathryn Deane, this fellowship provides financial assistance to African American students during the summer session at the Marine Lab.

Dean’s Scholarship. This fund was created by the Dean of the Nicholas School to recognize students with outstanding academic credentials.

Field Fellowship Fund. This fund was established by Marshall Field V, a close friend of the Nicholas School, to support students at the Nicholas School of the Environment.
Duke University

Virgil L. Fischer Student Recognition Endowment. Established by Mrs. Bernice Fischer, this fund provides fellowships to second-year professional degree students at the Nicholas School and provides an award to the Master of Environmental Management graduate with the highest academic achievement.

Forestry and Environmental Studies Fellowship. Established by the Cordelia S. May Trust, this fellowship provides financial support to Nicholas School students.

Friends of the Earth Scholarship Fund. This fund was established to support students interested in creative environmental advocacy as exemplified by Friends of the Earth International.

LeRoy George Scholarship. Established by the LeRoy George Children's Nature Museum Inc., this fund provides fellowships to Nicholas School students, with preference given first to students from Haywood and Buncombe Counties and Hendersonville in North Carolina. Second preference will be given to students from the Southern Appalachian region.

Verne Lester Harper Fellowship. Established by Verne Lester Harper, this fellowship provides financial support to Nicholas School students.

Charlotte and Robert Hay Fellowship. Established by Charlotte and Robert Hay, this fellowship provides support to Nicholas School students.

Richard Heintzelman Family Fellowship. This fellowship was established by Richard Heintzelman to support students interested in environmental economics or forestry.

Tim and Karen Hixon Wildlife Conservation Fellowship. This fellowship was established by George C. and Karen Hixon to support students interested in wildlife management and conservation.

Richard E. Hug Fellowship. Established by Richard Hug, this fellowship provides financial support to Nicholas School students.

International Paper Corporation Fellowship. This fellowship was established to support students at the Nicholas School of the Environment.

Thomas W. Keesee Jr. Fellowship. Established by Thomas Keesee Jr., this fellowship is for Nicholas School students.

Gorguze-Peters Family Fellowship Fund. Established by Lynn Gorguze and Scott Peters, this fund provides fellowships to graduate professional Nicholas School students.

Carolyn Odom Little School of the Environment Scholarship. Established by Terry H. Little, provides scholarships for Nicholas School students.

Melanie Lynn Memorial Scholarship. Established by Peter Lynn and David Lynn, this fellowship is for graduate students studying at the Marine Lab, with first preference to female students.

The Masselink Family Fellowship. Established by Mark D. and Priscilla P. Masselink, this fund provides fellowships to graduate professional Nicholas School students.

Andrew W. Mellon Fellowship. Established by the Andrew W. Mellon Foundation, this fellowship provides financial support for research experience at the Nicholas School.

Muchnic Foundation Fellowship. Established by the foundation, this fellowship provides financial support to Nicholas School students.

Mary Wade Myers and William D. Myers Scholarship Fund. Established by Mary Wade and William Myers, this fund provides scholarships to professional Nicholas School students.

The Nemergut Scholarship Fund. This fund was established in memory of an outstanding ecologist, researcher and educator, Diana Nemergut, wife of former dean, Alan Townsend, to support students at the Nicholas School of the Environment. The fund supports students who, through their background, can enrich the diversity perspectives in the academic life of the Nicholas School.

Nicholas School Professional Student Fellowship. Established by Sally S. Kleberg, this fellowship provides financial support to Nicholas School students.

Orvis Fellowship. Established by the Perkins Charitable Foundation, the Orvis-Perkins Foundation, and the Leigh H. Perkins Charitable Lead Trust, this fellowship is offered to Nicholas School students.

Orrin Pilkey Fellowship. This fund was established by Duke and Nicholas School alumni and friends in honor of distinguished professor emeritus and educator, Dr. Pilkey. This fellowship is for Nicholas School students applying research to human uses of the coastal zone.

Duke University

**Safrit Scholarship Fund.** This fund was established to support students at the Nicholas School of the Environment.

**Gary H. Salenger Fellowship.** Established by Gary Salenger, this fellowship is for Nicholas School students.

**William H. Schlesinger Scholarship.** This fund was established by Duke and Nicholas School alumni and friends in honor of the second dean of the Nicholas School, Dr. Schlesinger.

**Semans Scholarship Fund.** This fund was established to support students at the Nicholas School of the Environment.

**Bartow Shaw Family Fellowship.** This fellowship was established to support Master of Forestry students or students interested in forestry.

**Syngenta Crop Protection Inc. Fellowship.** This fellowship was established to support students interested in environmental toxicology or environmental risk assessment.

**Yasuomi Tanaka Memorial Fellowship.** This fellowship was established by Frances Tanaka to support international students.

**Thorensen Foundation Fellowship.** Established by Paul O’Connell, this fund provides fellowships for Nicholas School students.

**Wade Family Fund.** Established by Charles B. Wade, Jr. T’38, this fund provides scholarships for Nicholas School students studying at the Marine Lab.

**Dr. Larry R. Widell Memorial Fellowship.** Established by Christopher M. Widell, this fund provides scholarships to graduate professional Nicholas School students, with a preference given to doctoral students.

**Zirkle Fellowships.** Established by Sara and Lewis Zirkle, this fellowship is offered to Nicholas School students.

**FUNED Scholarship.** In partnership with the Fundación Mexicana para la Educación, la Tecnología y la Ciencia (FUNED), this scholarship supports students with Mexican citizenship.

**COLFUTURO Scholarship.** In partnership with the Fundación para el Futuro de Colombia, the Nicholas School provides tuition scholarship support to eligible admitted students with Colombian citizenship.

**Nicholas School Service Volunteer Scholarship.** This scholarship recognizes the value the Nicholas School places on the diversity of experiences from our students who have served as volunteers in service organizations such as Americorps, City Year, Peace Corps, Teach for America, and others.
Academic Regulations

Course Planning

Each of the professional programs has required courses or required areas of study, and responsibility for meeting these requirements before graduation rests with the student, with the assistance of the coursework advisor. During orientation, each student is assigned a faculty coursework advisor. Throughout the program, the student and advisor should use the Planner and Track Progress sections of Stellic to ensure four semesters of coursework will meet program course and credit requirements.

It is usually possible to change coursework advisors, with the approval of both the current and prospective advisors, and it is common to have as a master’s project advisor someone other than the coursework advisor. It is also usually possible to change programs through the end of the second semester (out of four required semesters of enrollment), provided that the student has met prerequisites for the new program and provided that it is still possible for the student to meet all requirements of the new program before graduation. A student changing programs will usually be assigned a new coursework advisor, and the student must complete a new course planning form showing how program requirements will be met. The student is responsible for ensuring that all degree requirements have been met. Faculty coursework advisors and staff in Student Services are available to advise and assist students but the final responsibility rests with the student.

Students in the DEL-MEM Program have the majority of their required coursework planned for them. Students work directly with the faculty program director, the staff program coordinator, and/or the Nicholas School registrar to ensure they are meeting these requirements before graduation; however, the responsibility rests with the students to successfully manage their coursework. DEL-MEM students will be assigned a master’s project advisor during their second semester.

Language Testing

Proficiency exams in written and spoken English will be given to non-native English speakers regardless of citizenship during the week prior to orientation week. Students found to lack the proficiency in English needed to do well at Duke will be required to enroll in additional English language instruction. Students who are required to take English language courses at Duke will be charged a $1,300 premium added to their bursar account for each English language course to help defray the added cost of the course. Students choosing to undertake outside tutoring in English should be prepared to assume all costs for being tutored and may need to reduce their course or research program while being tutored. MEM and MF students may count one English course as a general elective toward their degree; additional English language instruction does not count toward course credit required for the MEM or MF degree. Non-native English speakers applying to the DEL-MEM should consult with that program for specific requirements beyond the TOEFL, nicholas.duke.edu/admissions/how-apply.

Accommodations

Students desiring accommodations to support their studies should contact the Student Disability Access Office (access.duke.edu; email sdao@duke.edu). Students must provide appropriate documentation and discuss their needs with the professionals in that office. Duke University makes its own decisions regarding accommodations; just because a student received accommodations previously does not guarantee accommodations at Duke. If SDAO determines that accommodations are warranted, the office will communicate those accommodations to the ADA liaison in the Nicholas School, who will in turn communicate those accommodations to the student’s instructors. Students are responsible for providing course enrollment details to the ADA liaison in advance of each semester. Students may not request individual accommodation of instructors and instructors should direct students to SDAO or the ADA liaison for the school. The ADA liaison will work with the student and the instructors to ensure compliance.

More information about the SDAO is available in the Duke University Bulletin at registrar.bulletins.duke.edu/resources/sdao.

Registration

Entering students who enroll in the Master of Environmental Management, Master of Forestry, or DEL-MEM degree programs will receive instructions from the Nicholas School registrar about registering for courses. Registration for new students typically takes place during orientation week. Students in residence register for succeeding semesters at times scheduled in the university calendar.

Registration is approved by the advisor and completed by the student using an online registration system. Registration is required in order to take courses for credit or audit. To establish eligibility for university and other loans, for the student health service, and for study and laboratory space, a student must be registered. All tuition and fee payments and any indebtedness must be settled before registration can be completed.
Course Credits
Candidates for the professional degrees are considered fully registered when they enroll full-time for the number of semesters required in their individual degree programs (for example, four semesters for the MEM or MF degree). Students normally register for 12 course credits per semester, although a variation from 9 to 16 course credits is common. Students must have the permission of their advisor to register for more than 16.5 course credits in a semester, and all students who wish to enroll for fewer than 9 course credits must make a formal request to the education committee to study part-time.

Courses below the 500 level may not be applied toward the required credits needed for a master's/graduate degree, except for courses taught at the Duke Law School. With the approval of their program area, graduate students may enroll in lower-level courses as a course overload, but these courses will not count toward any graduation requirement (including electives) and will not count toward the credits required to demonstrate full-time enrollment status. Graduate/professional students interested in enrolling in courses below the 500 level must complete the appropriate registration form and submit it to the Office of Student Services.

The DEL-MEM Program is a minimum thirty-course credit degree program. To complete the DEL-MEM Program within four consecutive semesters, students typically take between 6 and 9 course credits per semester. Permission is required to register for fewer than 6 credits or more than 12 course credits in a semester. Students must be enrolled with at least 6 course credits to be considered a full-time student and to receive federal financial aid, if eligible. Students registering for fewer than 6 course credits per semester are not eligible to receive federal financial aid.

Transfer Credits
The Nicholas School does not accept transfer credits; courses taken through the Interinstitutional Agreement (see below) are not considered transfer credits.

Late Registration
All students should register at the times specified by the university. The charge for late registration is significant.

Drop/Add
The period for dropping and adding courses ends on the tenth calendar day of the fall and spring semesters. During the summer, dropping, or adding of courses is limited to the first three days of the term. Students are advised to make all class changes on the first day of class if possible.

Reciprocal Agreements with Neighboring Universities
Students enrolled full-time in the Nicholas School during the regular academic year may enroll for up to 6 course credits (two course maximum) per semester at The University of North Carolina at Chapel Hill, North Carolina State University, North Carolina Central University, or any other university participating in the Interinstitutional Agreement if they are also registered for at least 6 course credits at Duke during the same semester. Similarly, graduate students at these universities may take up to 6 course credits per semester at Duke. In the summer, students may take courses inter-institutionally if they are enrolled at Duke for at least the same number of hours they wish to take at the other school(s); graduate students are limited to two summer courses at other institutions. This agreement does not apply to contract programs such as the American Dance Festival. The student must pay any special fees required of students at the host institution and provide their own transportation. A transportation service sponsored by the Robertson Scholars Program travels between Duke and Chapel Hill and on a regular schedule during the academic year. The reciprocal agreements with neighboring universities do not apply to distance-learning programs. In general, online or distance-learning courses are not part of the interinstitutional agreement. If a student identifies a course at one of the participating institutions that is offered only in an online format, the student may petition the Nicholas School registrar and appropriate program chair for permission to take the course through the Interinstitutional Agreement. Decisions will be on a case-by-case basis with no expectation of setting a precedent.

Immunization Requirement
North Carolina law requires students entering a college or university in the state to be immunized against measles, rubella, tetanus, pertussis, diphtheria, and in some cases, polio. Each entering student is required to present proof of these immunizations in accordance with the instructions contained in the Student Health Services form provided with the student’s matriculation material. This form should be completed and returned to Student Health Services prior to the student’s first day of classes. Duke University cannot permit a student to attend classes unless the required immunizations have been obtained. Students who fail to meet the immunization requirements will be withdrawn from the university. DEL-MEM students are exempt from this requirement unless the student chooses to
take courses on campus. If that happens, then a Certificate of Immunization or record of immunization must be presented on or before the date the person first registers for a semester. All students, including DEL-MEM students, must show proof of vaccination for COVID-19 or be approved for medical or religious waiver.

Courses

Course Descriptions
Courses offered by the school are described in this bulletin. However, courses are subject to change. Prior to registration for a given term, the Office of Student Services prepares a list of courses to be offered.

Independent Study
All professional degree students have the opportunity to pursue independent study with individual faculty members. After discussing the potential for an independent study with a faculty member, students register to take independent study credit under Environment 593 (Environment 997 for DEL-MEM students).

Field Trips, Field Work and Travel Courses
The MEM and MF degrees are applied and experiential in nature. Field trips and travel courses enhance that experiential learning and add significant value to the learning experience. Course Field Trips are defined as experiential learning trips or field work taking place outside the normal assigned classroom and are considered a required or recommended (but optional) element of a course.

Course Planning
Faculty should determine whether experiential learning opportunities are required or optional for a course offering. Consideration should be given to whether there are reasonable alternatives aligned with course objectives for required experiential learning activities. Students who do not participate in optional experiential learning activities should not be negatively impacted through the grading process or otherwise.

Faculty are responsible for planning and working with the Nicholas School administrative staff on the logistics of field trips, including transportation, meals, communications, and safety protocols.

In all cases where a field trip or field work necessitates a student leaving campus, the following policies and procedures must be observed:

- The instructor must include all details regarding any field or travel for the course in the course syllabus.
- The instructor must discuss the field trip with the students enrolled in the course on the first day of class.
- Required field trips may not be scheduled so as to conflict with other courses.
- Students must have the opportunity to consider the requirements of the course and make an enrollment decision prior to the conclusion of drop/add.
- If required, the student must sign a participation agreement provided by the instructor and submit the signed agreement to Student Services prior to departure. Students who do not sign the agreement may not participate in the field experience.
- The instructor must file an Emergency Response Plan with Student Services in advance of departure.
- Transportation must be provided; students may not use personal vehicles for travel related to field trips. Drivers must be instructors or teaching assistants and they must have completed the required training.
- Some courses will require course fees to offset the cost of travel. Those course fees will be listed in DukeHub and assessed to the student’s bursar account. Should the student need additional financial aid to cover the additional travel cost, the student should consult their financial aid counselor.

Field Trips and Travel: Adjustments due to continuing COVID-19 Pandemic
Due to the continuing COVID-19 pandemic, field trips and travel are permitted with caution and careful attention to public health concerns. International travel is currently limited. Students should consult with Global Travel and Administrative Support, travel.duke.edu/restricted-regions-list, for lists of restricted regions. Regardless of the travel associated with a course or field work, all students, faculty and staff must abide by the Duke Compact. The following conditions must be met:

- Masks must be worn according to CDC and local policy in effect at the time of the travel.
- Transportation must be arranged that allows for fresh air circulation and cleaning of all shared surfaces.
- On-site, students may be required to wear masks and use appropriate materials for hand disinfecting/washing.
- Gloves are recommended when using and disinfecting shared equipment and disposed of properly, safely and responsibly upon completion.
Common surfaces including door handles and shared equipment should be disinfected appropriately with special attention to common touch points such as handles, steering wheels, mirrors and armrests.

The Nicholas School community will be notified through normal channels of any changes to the above policy.

**Master's Project—On-Campus Students**

All students must complete a capstone master's project in which knowledge, skills and tools acquired during the two years of study are applied to address environmental problems. Students will receive 4 to 6 course credits for the master's project. No student will be permitted to register for the fourth term of study until a project proposal has been approved and signed by the student's advisor and received by the school's Office of Student Services. During the final two terms, major emphasis should be placed on the project.

Most students in the MEM and MF programs complete collaborative, or group, master's projects. In group master's projects, teams of three to five students take on a real-world challenge facing a client. Students work directly with the client, under the supervision of an assigned faculty advisor, to address the challenge. These projects begin in the spring of the first year but are completed during the second year of study; some group master's projects include summer work as well.

Fewer numbers of students complete individual and/or more research-based master's projects. Students in this group should identify their project during the second term of study, work on it during the summer between academic years and complete it during the third and fourth terms.

Students may use summer internships as the basis for master's projects and may consult closely with a supervisor outside the school to complete the work, though their faculty supervisor is the final reviewer and grader of the project. In most cases, project advisors for individual master's projects are assigned by faculty committee, taking into account subject matter, experience, interest, as well as equitability of advising responsibilities.

Students should maintain close contact with their advisors throughout their work on the master's project. Advisors review and approve the project in mid-March for public presentation in early April. All students are required to make a public presentation of their project at a Master's Project Symposium that is open to the public.

All completed master's projects are required to be uploaded to Duke Library's DukeSpace website and are searchable across the Internet. If the master's project contains sensitive information (e.g., from the client's point of view, in terms of future publication elsewhere, or sensitivity for commercial ventures) students may create a redacted version of the written master's project or request an embargo of up to two years.

**Master's Project—DEL-MEM Students**

All DEL-MEM students must complete a master's project of 4-6 course credits. The project should be identified during the second term of study, initiated during the summer between academic years and completed during the third and fourth terms. During the final two terms, major emphasis should be placed on the project. In completing the project, the student applies theoretical and analytical training acquired during the two years of study to actual natural resource or environmental problems. DEL-MEM students are encouraged to use current professional career interest and projects as the basis for their master's project and may consult closely with a supervisor outside the school, as well as with their faculty master's project advisor, to complete their work. Students should maintain close contact with their advisors during the development and writing of the master's project. Projects should reach final stages of completion by midterm of the final semester. A complete draft of the project must be delivered to the advisor prior to October 1 for those graduating in December, prior to March 1 for those graduating in May, and prior to July 1 for those graduating in September. The advisor is responsible for critical assessment and grading. Actual dates may fluctuate depending on possible changes to the organization of the MP process.

**Auditing**

Students registered for a full course load may audit courses free of charge. Otherwise, the audit fee is $680 per course credit. In classes in which enrollment is limited, students enrolled for credit will receive priority. Audited courses are recorded with a grade of AD for satisfactory completion or WA for unsatisfactory completion on the student's permanent record. Regular attendance is expected. Changes from audit to credit are not permitted after the Drop/Add period. Audited courses may not be used to fulfill either program or graduation requirements. Audited courses may not be counted toward the number of credits required for graduation. Students must obtain written permission of the instructor to audit a course.

**Executive Education Short Courses**
Non-degree short courses are offered through the Nicholas School's Executive Education (NSEE) Program. View registration, enrollment and availability policies nicholas.duke.edu/academics/executive-education. Policies and course offerings are subject to change without notice.

Retaking Courses
Courses required as a part of the program elected by the student or required by the advisor must be retaken if failed. Courses prerequisite to more advanced courses the student wishes to take must be retaken if failed. Elective courses may be retaken if the student wishes to do so. See the section on grades below for additional information.

Class Attendance
It is expected that students attend class every time the course meets. It is understood that on occasion the student may need to miss class due to illness. Whenever possible, as a courtesy to the instructor, the student should be in communication with the instructor in advance of the absence. If the absence is unexpected due to illness, the student should alert the instructor as soon as possible. If a medical condition or extended illness causes the student to miss more than one class meeting, a doctor's note should be provided to Student Services. If a medical condition or extended illness causes absence from a test, mid-term, or exam, the instructor may arrange an alternate test date, at the instructor's discretion. If such is the case the student must provide a doctor's excuse to Student Services.

Grades
Grading System
The grading system used in the Nicholas School and The Graduate School is as follows: A (exceptional); B (good); C (satisfactory); F (failing); I (incomplete); Z (continuing). Plus (+) and minus (-) notations are permitted. Course instructors are unable to change grades once final grades have been submitted unless there has been an error in calculation or transcription.

The grades of P (pass) and F (fail) are used in the Nicholas School for seminars, master's projects, program area seminars, and modular courses. At the instructor's option, the grades of P or F or regular letter grades are used for intensive courses and independent projects. If a student wishes to take a regularly letter-graded course on a Pass/Fail basis, permission for the Pass/Fail option must be obtained in writing from the instructor prior to registration for the course. Regularly graded courses taken on a Pass/Fail basis may not count toward graduation or fulfill programmatic requirements.

The grade of Z is assigned for an independent project or a master's project that extends over a period of more than one semester; a final grade is given upon completion of the project.

Incomplete Grades
A grade of I indicates that some portion of the student's work is lacking, for an acceptable reason, at the time grades are reported. Students unable to complete course requirements by the deadline must have communicated with the instructor well in advance of the conclusion of the course so that the instructor may determine if an Incomplete is appropriate and necessary. Students who fail to communicate with the instructor and who fail to complete the course requirements will be assigned a failing grade (F). Requirements of all courses in which an instructor assigns a grade of Incomplete must be fulfilled within one calendar year following the date of the assignment of the incomplete grade.

In exceptional circumstances, upon recommendation of the professor who assigned the grade of Incomplete, the dean of the Nicholas School may extend the time for completion of the course requirements. If, in the judgment of the professor and the student's advisor, completion of the requirements is not a reasonable alternative for the student, the student may petition the Education Committee to allow the grade of I to stand permanently on their record. No student will be allowed to graduate with an Incomplete unless permission has been granted for it to stand permanently on the record.

Failure
Failing a course may leave a student short of credits for graduation or lacking program curriculum requirements. If the failed course is not necessary to complete program curriculum requirements, the student may substitute another course to make up the lost credit, with the advisor's approval. If the failed course is necessary to complete program curriculum requirements, the student must retake either that course or an acceptable substitute, with the advisor's approval. Both the original failing grade and the grade received for the retaken or substitute course will appear on the student's transcript.

Failure of a course also subjects the student to dismissal.

Probation and Dismissal
Any of the following situations will result in probationary status for the following semester:

- Failing one or more courses
- Two or more C (C-, C, C+) grades in a semester
- Failing to maintain a cumulative average of at least B-

A student on probation must meet jointly with their advisor and one additional regular-rank faculty member selected by the student and their advisor before the end of Drop/Add (preferably before the beginning of the semester) to discuss what is going wrong and how to remedy it. These faculty committees or the Education Committee have the discretion to suggest that a student take a leave of absence for a semester if they judge that to be the best way for the student to improve academic performance. A student on probation must meet again with the advisor and second faculty member a month after the first meeting to review academic progress.

Any student who does not meet academic standards at the end of the probationary semester will be subject to dismissal from the Nicholas School. The Education Committee will make decisions on dismissal.

In addition, students must have at least 48 course credits (30 course credits within the DEL-MEM Program) with a grade point average of B- or better to graduate. Students who fail to meet that standard during their final semester must take additional Duke course credits to meet the standard before they can graduate. Any exceptions are at the discretion of the Education Committee.

1. For students placed on probation, the Nicholas School’s policy regarding awards from the school (e.g., merit-based financial aid, fellowships, scholarships, recognition awards with no monetary component) is as follows: Students not in good standing (with regard to academics or honor code) are not eligible for any new awards from the Nicholas School (e.g., scholarships, fellowships, school-supported internships, and recognitions without monetary component) whether academic performance is a criterion or not.

2. Students holding scholarships or other awards when they are put on probation may be allowed to keep them for one semester if the student’s petition to do so is approved by the associate dean for professional programs and the assistant dean for student services. Any student not released from probation after one semester will not be eligible to retain the scholarship/fellowship.

Students who are dismissed for honor code or other serious violations must relinquish any awards.

**Satisfactory Academic Progress**

Federal regulations require that, in order to be eligible for assistance from any Federal Title IV student aid program, including but not limited to the Federal Direct Unsubsidized Loan and the GradPLUS loan, a student must be making satisfactory academic progress.

For the purpose of Title IV financial aid eligibility only, a student enrolled in the Master of Environmental Management and/ or Master of Forestry degree in the Nicholas School of the Environment as a full-time degree-seeking student must meet the following standards of satisfactory academic progress:

1. The student must have a cumulative grade point average of at least a B- (2.7) or higher after completing their first semester and at the end of each subsequent semester (fall and spring semesters; does not include summer terms one and two).

2. A student in either the MEM or the MF must earn their degree before earning 72 course credits (150% of the standard minimum 48 credits). A student in the dual MEM/MF must earn at least 72 course credits in order to graduate and successfully complete the degree requirements before earning 108 course credits. A student in a dual degree program must complete successfully at least 36 course credits and earn their degree before earning 54 course credits on their Nicholas School transcript. Students must successfully complete all of their degree requirements before obtaining 150% of the credits needed to graduate from each program as outlined.

3. The student must earn satisfactory grades in at least 67% of their cumulative credits. Satisfactory grades in the Nicholas School are A, B, C (including + and -), CR and P.

Any student who fails to meet satisfactory academic progress will be placed on Title IV warning for one semester. During that semester, the student will continue to be eligible for Title IV aid. At the end of a term during which a student is on Title IV warning, if the student still fails to meet any of the requirements, the student will become ineligible for Title IV assistance.

**Academic Irregularities**

All cases falling outside the stated policies and procedures of the school are referred to the Education Committee for decision. The committee reviews and makes decisions regarding course requirements for graduation, student probation and dismissal, student petitions for waivers of degree requirements and all actions that deviate from established academic regulations. Any waiver requests to reduce credits, course requirements, minimum semesters of tuition, or in-residence requirements must be made before half of the total credits are completed for the student’s degree program.
A student who desires to petition the committee should do so by writing to its chair. A precise statement of the reason for the request is required. The student will be notified in writing of the decision of the committee by the chair.

Transcripts of Credit
A student who is registered for a course and who successfully completes the requirements as prescribed by the instructor receives credit on university records. A transcript fee, charged to all students during their first semester of enrollment, covers all future transcript requests. Only the Office of the University Registrar issues transcripts of credit. Currently enrolled students may request transcripts through DukeHub. Alumni wishing to request transcripts should go to registrar.duke.edu/student-records-resources/transcripts-and-verifications and complete the online form. No transcripts will be issued for students who fail to clear all financial obligations to the university upon graduation.

Length of Study
For full-time on-campus students and DEL-MEM students, the typical time for completing a professional master’s degree is four semesters, not including summer. All degree requirements for the MEM, MF, and DEL-MEM must be completed within five years of the first term of admission. Any term/s during which the student is not enrolled for any number of credits still count and are included in the five-year window for completion.

For a typical dual degree student, the normal time for completing both professional degrees is five to eight semesters depending on the other concurrent degree being pursued. The time to degree completion remains five years from the first term of admission. Any term/s during which the student is not enrolled for any number of credits still count and are included in the five-year window for completion.

Leave of Absence or Withdrawal
Occasionally, special circumstances require a student to leave the university for one or two semesters at a time. If the reason for the departure is considered an emergency, the student may request a leave of absence for a period not to exceed one year. If the reason is to study elsewhere in a combined degree program, a leave will be granted for the length of study. If the student plans to do field studies or an internship, they must maintain university enrollment by paying a registration fee each semester of the academic year until full-time study is resumed.

Under all circumstances, the student must request the leave for a specific length of time prior to departure from the university. Extensions must be requested if they are required for a maximum of two semesters, except as indicated above. Failure to request a leave or an extension of leave may result in a penalty charge and/or dismissal from the university. A student is eligible to request a leave of absence only after having completed at least one semester of study.

A student who wishes to withdraw from the university must make a written request to do so. For refunds upon withdrawal, see the section on financial information above.

Graduation
Even if degree plans are tentative, a candidate for a degree must apply for graduation at the designated time for each semester. The registration is valid only for the semester for which it is filed. If the student does not receive the degree as expected, they must register again at a later time.

All candidates are encouraged to attend the commencement exercises at which their degrees are to be awarded. A student who is unable to attend must notify the assistant dean for student services no later than four weeks prior to commencement to receive the degree in absentia.
Career and Professional Development

The Nicholas School of the Environment operates its own Career and Professional Development Center (CPDC) for MEM, MF, and DEL-MEM students and alumni, including those students enrolled in concurrent degree programs.

The professional staff in CPDC are leading career experts for the environmental and natural resource profession. To help students maximize their career readiness, the center’s professional staff pledges to:

- Assist in developing a student’s personal career strategy;
- Help students refine and communicate career skills they possess and acquire new ones for career success;
- Assist in making connections with professionals and alumni in a student’s chosen field;
- Provide a variety of career experiences, tools, and resources.

For more information, visit nicholas.duke.edu/careers.

The Nicholas School recommends three main career networking platforms—a Nicholas School Job Share Facebook group managed by alumni, the Duke Alumni Association database, and the NSOE LinkedIn group. The LinkedIn group is managed by CPDC, and members are vetted to ensure they are a member of the Nicholas community (prospective/student, alumni, faculty, or staff) before being admitted to the group.

The CPDC schedules career exploration opportunities, employer information sessions, site visits and on-campus recruiting events throughout the academic year to allow students to meet employers and broaden their knowledge of the environmental profession.

The University Career Center (UCC) at Duke (studentaffairs.duke.edu/career) provides career services to Trinity College undergraduates and doctoral students in The Graduate School.

Summer Enrichment Opportunities

Practical experience is integral to the Nicholas School’s educational process and even more important to employers seeking qualified candidates. Some type of summer enrichment experience is recommended, but not required, between academic years of study. The CPDC staff can assist students in identifying internships to meet professional development goals or research interests. Internships, fellowships, or research experiences are opportunities for students to explore or enhance career experiences, learn or apply new skills, establish networks of practicing professionals, and gain perspective on environmental issues in various regions or countries.

Typically more than 90 percent of all Nicholas School students report completing summer enrichment experiences during their MEM or MF program.

Each year Nicholas School students participate in summer experiences throughout the United States and around the world. Students work with consulting firms, business, industry, nonprofit organizations, government agencies, and international organizations to supplement career preparation or research interests. Enrichment experiences may be secured at other times throughout the school year.

Summer Enrichment Funding Opportunities

The CPDC staff may also assist students in identifying paid opportunities or securing small grants for underfunded summer projects. The Nicholas School provides additional financial support that MEM, MF, and DEL-MEM students utilize to partially support both US-based and international internships. Students typically apply for summer enrichment funding in the spring term of years in which they are not graduating.

Made possible by the generous support of Fred and Alice Stanback, the Nicholas School partners with targeted conservation organizations to administer the Duke University Stanback Fellowship Program. Its purpose is to provide all Duke students with the opportunity to apply for a significant paid summer learning experience in environmental policy, research, applied resource management and/or stakeholder engagement. In 2022, approximately 90 internship projects with 32 non-governmental conservation organizations were secured exclusively by Nicholas School and Duke University students. Incoming MEM and MF students may become eligible to apply once Student Services confirms receipt of the tuition deposit.

Employment Trends & Statistics

The variety and geographic distribution of organizations that employ Nicholas School graduates demonstrate the value and relevance of the Master of Environmental Management and the Master of Forestry programs. Graduates’ career success confirms the marketability of a professional/graduate degree from Duke.
The following employment statistics are based on data collected for the Nicholas School class of 2021, six months following graduation.

<table>
<thead>
<tr>
<th>EMPLOYMENT SECTOR</th>
<th>AVERAGE SALARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business/Industry/Startup</td>
<td>30%</td>
</tr>
<tr>
<td>Consulting</td>
<td>28%</td>
</tr>
<tr>
<td>Federal Government</td>
<td>16%</td>
</tr>
<tr>
<td>Nonprofit/Higher Ed/Think Tank</td>
<td>20%</td>
</tr>
<tr>
<td>State/Local Government</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Salary**

The reported annual salary mode for 2021 graduates was in the range of $70,000 to $74,000 (16.5% of respondents). Reported salaries vary widely depending on the type of employer, employment sector, individual qualifications, previous experience(s) and employment location.

**Sample First Destination Employers (Class of 2021)**

<table>
<thead>
<tr>
<th>CORPORATE/CONSULTING</th>
<th>PUBLIC SECTOR</th>
<th>NGO/RESEARCH/THINK TANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloomberg</td>
<td>California Public Utilities Commission</td>
<td>Cape Elizabeth Land Trust</td>
</tr>
<tr>
<td>Bluesource</td>
<td>Delaware River Basin Commission</td>
<td>Consortium for Ocean Leadership</td>
</tr>
<tr>
<td>Cardno Chemrisk</td>
<td>Federal Energy Regulatory Commission (FERC)</td>
<td>Ducks Unlimited</td>
</tr>
<tr>
<td>Goldman Sachs</td>
<td>Federal Environmental Management Agency (FEMA)</td>
<td>Duke University</td>
</tr>
<tr>
<td>ERM Consulting</td>
<td>National Marine Sanctuaries Foundation</td>
<td>Environmental Defense Fund (EDF)</td>
</tr>
<tr>
<td>Finite Carbon</td>
<td>National Oceanic and Atmospheric Administration (NOAA)</td>
<td>Forest Trends Association</td>
</tr>
<tr>
<td>ICF Consulting</td>
<td>National Renewable Environmental Laboratory</td>
<td>Gordon and Betty Moore Foundation</td>
</tr>
<tr>
<td>McKinsey and Co.</td>
<td>North Carolina Dept. of Natural and Cultural Resources</td>
<td>Nicholas Institute for Environmental Policy Solutions</td>
</tr>
<tr>
<td>National Grid</td>
<td>NYSERDA</td>
<td>RMI</td>
</tr>
<tr>
<td>Nike</td>
<td>Smithsonian National Zoological Park</td>
<td>San Francisco Estuary Institute</td>
</tr>
<tr>
<td>Pine Gate Renewables</td>
<td>US Army Corps of Engineers</td>
<td>St. Croix Sea Turtle Project</td>
</tr>
<tr>
<td>PWC</td>
<td>US Environmental Protection Agency (EPA)</td>
<td>World Cocoa Foundation</td>
</tr>
<tr>
<td>Raffelis</td>
<td>US House of Representatives</td>
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<tr>
<td>Raymond James Financial</td>
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<tr>
<td>Schneider Electric</td>
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<tr>
<td>SCS Global Services</td>
<td></td>
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<tr>
<td>Stokes Environmental</td>
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</tr>
</tbody>
</table>
International Master of Environmental Policy (Duke Kunshan University)

The Sanford School of Public Policy and the Nicholas School of the Environment (NSOE) offer a two-year International Master of Environmental Policy (iMEP) program based at the Duke Kunshan University campus in Kunshan, China. The iMEP Program offers a highly analytical and multidisciplinary master’s degree based on the Duke Master of Public Policy (MPP) and Master of Environmental Management (MEM) programs. With an emphasis on both international and Chinese experience and contexts, the iMEP combines a world-class faculty, a cutting-edge research center, an innovative curriculum, and unparalleled career opportunities.

Duke Kunshan University’s iMEP Program prepares its graduates to meet the pressing environmental and economic challenges facing the international community through effective policy solutions by drawing from an array of disciplines. The core curriculum combines economics, science, law and governance, policy, and program evaluation. The program is four semesters and includes sixteen courses for a total of 48.0 graduate course credits. The program allows Duke Kunshan University students to spend their third semester at Duke. In their second year, iMEP students complete a client-based or quantitative research master’s project in partnership with an academic advisor.

The iMEP Program simultaneously creates a one-semester study away opportunity for Sanford MPP/MIDP and NSOE MEM/MF students, who may travel to Duke Kunshan University in their third semester. Duke and Duke Kunshan faculty may participate in a similar exchange.
Admissions

Eligibility

iMEP seeks applications from a variety of academic, professional, ethnic, and cultural backgrounds. The iMEP Program is an international program seeking applicants from across the globe. The selection committee considers the applicant's academic performance as an undergraduate, range of courses taken, Graduate Record Examination (GRE) scores (optional), TOEFL and IELTS scores, English and writing skills, personal statement, relevant work experience, and faculty and employer evaluations.

As prerequisites, applicants must hold the equivalent of a US bachelor's degree from an accredited institution. Also, iMEP recommends students complete both basic statistics and microeconomics courses prior to enrollment.

Application

Applications are submitted online through the iMEP admissions website. The application priority deadline for the iMEP Program is January 15. After the priority deadline, applications for the iMEP will continue to be accepted and considered on a space available basis until May 31. The iMEP Program waives the application fee. The online application page is available at env.dukekunshan.edu.cn/admissions/how-to-apply.

In addition to the prerequisite bachelor's degree, the following are required:

- Complete online application form
- Résumé/ CV
- Statement of Purpose (500–1,000 words): As part of the online application, the applicant must upload a Statement of Purpose. The statement should be one to two pages and single-spaced. It should briefly discuss:
  - Purposes and objectives in pursuing graduate study;
  - Special interests and plans;
  - Strengths and weaknesses in the applicant's chosen field;
  - Any research projects or any independent research in which the applicant has actively participated and how they have influenced their career choice and desire to pursue graduate studies; and
  - Any particular reasons the applicant may have for applying to Duke Kunshan University (e.g., the applicant would like to work with a specific faculty member).
- Transcript(s): Transcript from each post-secondary institution attended is required (an uploaded unofficial transcript with degree posted and other transcripts for all colleges and universities attended).
- Test Scores:
  - Graduate Record Examination (GRE)
    - In light of testing center disruptions caused by the COVID-19 pandemic, iMEP has waived the Graduate Record Examination (GRE) test score requirement for the 2022-2023 application cycle (for Fall 2023 enrollment). Applicants may still submit GRE scores if they feel the scores enhance their application. If you choose to enter self-reported test scores, official test scores will become a required component of your application.
    - Ask Educational Testing Service to send an official copy of the scores to Duke Kunshan University, using institution code 7552. No department code is needed. If ETS requires a department code, select any one of the department codes listed. Regardless of the department code entered, the scores will come to Duke Kunshan University as long as applicants use institution code 7552. Be sure to alert the iMEP Program if the name on an application is different from the name on an applicant's score report.
  - GRE Equivalent: Applicants may apply for a GRE score waiver by meeting any of the following requirements:
    - High GPA and appropriate coursework at an elite university. The applicants from DKU and “Project 985 Universities” in China with 3.5+ GPA or top 20% ranking in the major class can request to waive the GRE. Applicants without an undergraduate degree from an English-language university must have 105+ TOEFL (or 7.5+ IELTS). The applicants from outside China must provide evidence to justify their course work and university status.
    - Specific alternative tests. GMAT, LSAT, TEM-8 scores can be used in lieu of GRE.
    - Years and quality of experience for mid-career professionals. The work experience must be sufficient to demonstrate writing, quantitative and analytic skills.
    - Advanced terminal degrees such as PhD, MD, JD, and EdD.
  - Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). The program’s language of instruction is English, and written and spoken English proficiency is required. Students who are not native English speakers must provide language evaluation test scores with their application materials.
TOEFL: The minimum score for the TOEFL Internet-based Test (TOEFL iBT) is 90. Ask Educational Testing Service to send an official copy of the scores to Duke Kunshan University, using institution code B624. Applicants do not need a department code. If ETS requires a department code, select any one of the department codes listed. Regardless of the department code entered, the scores will come to Duke Kunshan University as long as applicants use institution code B624.

IELTS: The minimum score for IELTS is 7.0. Please email iMEP@dukekunshan.edu.cn for mailing address. The IELTS is administered by Cambridge ESOL, British Council, and IDP: IELTS Australia. See ielts.org for more information.

Duolingo English Test: There is no institutional code for Duolingo, but applicants will need to select Duke University Graduate Programs: Graduate School; Divinity; Engineering; Environment; Public Policy; Duke Kunshan as the institution to send scores to. Make sure to include subscores. Score reports without subscores will not be accepted.

TOEFL/IELTS/Duolingo Waiver Policy: If applicant’s native language is any language other than English, they must submit an official score report from the Test of English as a Foreign Language (TOEFL), the International English Language Testing System (IELTS), or Duolingo exam. This requirement may be waived if the applicant earned an undergraduate degree in the United States, earned an undergraduate or master’s degree from an English-only speaking institution outside of the United States, or has been working in the United States for two years or more. If you believe you qualify for a TOEFL/IELTS/Duolingo waiver based on the above criteria, indicate your eligibility in the Additional Academic Information section of the application under the Test Score Instructions for the TOEFL/IELTS exam. Due to the volume of applications we receive, we will not examine, confirm the status of, or grant any waiver requests prior to extending an offer of admission.

Letters of Recommendation: At least two letters of recommendation (two academic references and one professional preferred).

Visiting Duke Kunshan and the iMEP Program

Professors, scholars, and prospective students are welcomed to visit iMEP at Duke Kunshan University. During the visit, they can learn detailed information about academic programs, research projects, administrative methods, and cooperation opportunities. To schedule a meeting with the iMEP Program, please contact program coordinator program coordinator Meng Qu (meng.qu@dukekunshan.edu.cn).
### Tuition & Fees

Duke Kunshan University offers a world-class education for highly qualified students from all backgrounds. The cost of attending Duke Kunshan reflects the university’s commitment to providing an outstanding educational experience and is comparable to that of other leading private universities.

Duke Kunshan is committed to enrolling a highly talented, diverse and international student body. Scholarship support is available to support these goals. All applicants will automatically be considered for available scholarships, up to and including full scholarships. Special financial aid will be offered to all Chinese students from mainland China, Hong Kong, Macau and Taiwan to lower the tuition standard to RMB 180,000 per year. Additional scholarships of varying amounts will be available based on academic achievement and family financial circumstances. Admitted students will be given an opportunity to submit supplemental financial information.

### Tuition and Fees for the 2022-2023 Academic Year

<table>
<thead>
<tr>
<th>Cost of Attendance for International Students (non-Chinese citizens)</th>
<th>FIRST-YEAR STUDENT</th>
<th>SECOND-YEAR STUDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fall (Kunshan) 2022</td>
<td>Spring (Kunshan) 2023</td>
</tr>
<tr>
<td>Tuition</td>
<td>$21,375</td>
<td>$21,375</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>$100</td>
<td>-</td>
</tr>
<tr>
<td>Student Fees</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Health Fee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Transcript Fee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Activity Fee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Graduate Student Service Fee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>• Recreation Fee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Tuition and Fees</strong></td>
<td>$21,475</td>
<td>$21,375</td>
</tr>
<tr>
<td>Books &amp; Supplies</td>
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<td>$100</td>
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<tr>
<td>Housing</td>
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<tr>
<td>Board</td>
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<td>$1,350</td>
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<tr>
<td>Domestic/International Travel</td>
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<tr>
<td>Local Transportation</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Miscellaneous/Personal Expenses</td>
<td>$857</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Living Expenses</strong></td>
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<td>$2,636</td>
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<tr>
<td><strong>Total Cost of Attendance</strong></td>
<td>$27,318</td>
<td>$24,111</td>
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</table>

### Cost of Attendance for Domestic Students (Chinese Citizens)

*Figures are in RMB.*

<table>
<thead>
<tr>
<th>Cost of Attendance for Domestic Students (Chinese Citizens)</th>
<th>FIRST-YEAR STUDENT</th>
<th>SECOND-YEAR STUDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fall (Kunshan) 2022</td>
<td>Spring (Kunshan) 2023</td>
</tr>
<tr>
<td>Tuition</td>
<td>¥90,000</td>
<td>¥90,000</td>
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### Duke University

<table>
<thead>
<tr>
<th></th>
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<th>¥,800</th>
<th>¥15,638</th>
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<tbody>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Fees</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Health Fee</td>
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<td>¥5,179</td>
</tr>
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<td>• Transcript Fee</td>
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<td>¥3,023</td>
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<tr>
<td>• Activity Fee</td>
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<td>¥806</td>
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<tr>
<td>• Graduate Student Service Fee</td>
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<td>¥127</td>
</tr>
<tr>
<td>• Recreation Fee</td>
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<td>¥74</td>
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<tr>
<td><strong>Total Tuition and Fees</strong></td>
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<td>¥90,800</td>
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<tr>
<td><strong>Books &amp; Supplies</strong></td>
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<td>¥700</td>
<td>¥700</td>
<td>¥2,212</td>
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<tr>
<td><strong>Housing</strong></td>
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<td>¥9,000</td>
<td>¥9,000</td>
<td>¥41,020</td>
</tr>
<tr>
<td><strong>Board</strong></td>
<td>¥9,450</td>
<td>¥9,450</td>
<td>¥9,450</td>
<td>¥13,125</td>
</tr>
<tr>
<td><strong>Domestic/International Travel</strong></td>
<td>¥1,000</td>
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<td>¥1,000</td>
<td>¥15,750</td>
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<tr>
<td><strong>Local Transportation</strong></td>
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<td>-</td>
<td>-</td>
<td>¥5,677</td>
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<tr>
<td><strong>Miscellaneous/Personal Expenses</strong></td>
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<td>¥7,500</td>
<td>¥7,500</td>
<td>¥14,210</td>
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<tr>
<td><strong>Total Living Expenses</strong></td>
<td>¥25,950</td>
<td>¥26,950</td>
<td>¥26,950</td>
<td>¥90,650</td>
</tr>
<tr>
<td><strong>Total Cost of Attendance</strong></td>
<td>¥116,950</td>
<td>¥117,650</td>
<td>¥118,450</td>
<td>¥202,647</td>
</tr>
</tbody>
</table>

All figures are estimates only.

**Cost of Attendance (COA) Notes**

- All fees and rates provided at this time are estimates.
- All tuition will be invoiced by and paid to Duke Kunshan University. Other fees and charges will be invoiced and paid in either China or the United States.
- Duke Kunshan student residence and dining facilities are closed during the winter break between the fall and spring semesters and for seven days during the Chinese New Year Holiday. Students should arrange the accommodation during the campus closing periods. The costs are not included in the above estimated costs of attendance. Students need to pay the costs by their own.
- International travel includes an estimate of the cost of one round-trip flight to the United States for Chinese students or from an international destination to Shanghai for international students, typical visa costs, and, for non-Chinese students, additional health check and registration costs associated with establishing legal residence in China. Students wishing to return to their home countries during breaks in their study before the end of the year should budget additional funds for these trips. For detailed information about insurance, click here: dukekunshan.edu.cn/clinic/health-insurance.
- US based and international students from outside the United States (i.e., India, Africa, Hong Kong, Macau, Taiwan) who do not apply through Duke’s GEO (Study Abroad) application system are required to enroll in the Global Health Insurance Plan.
- Insurance plan year is August 1-July 31; insurance will be charged at the actual approved rate regardless of prior estimates. International students are required to purchase and enroll in the Health Insurance Plan (including SOS) from the university. For detailed information about insurance, click here: dukekunshan.edu.cn/clinic/health-insurance.
- All students must pay a refundable Campus Deposit of RMB 2,000/USD $300. The deposit would be used to pay for the costs of replacement of lost DKU cards; repairs of residence damages; excessive cleaning; refrigerator rental; library overdue, damaged, or lost books; replacement processing fees; and other similar losses and damages caused to university properties.
Financial Aid

Merit-Based Scholarship
Duke Kunshan University is committed to enrolling a highly talented, diverse, and international student body. All students are automatically considered for merit scholarships based on their Graduate School application. No additional application is required to be considered for these awards.

Bayeco Environment Fellowship
Bay Environmental Technology (Beijing) Corp (Bayeco) established the first fellowship program to support the iMEP Program at Duke Kunshan University. The establishment of the Bayeco Environment Fellowship will attract more talents with global vision and focus towards environmental challenges to enroll and study at the iMEP Program. The fellowship will create more opportunities for students to experience the global and innovative education model at Duke Kunshan and help to educate the next generation of environmental leaders for China and the world.

Chancellor’s Scholarship
In honor of LIU Jingnan and Mary Bullock, Duke Kunshan University's inaugural Chancellor and inaugural Executive Vice Chancellor, the scholarship is named “Chancellor’s Scholarship” and is the highest honor for incoming Duke Kunshan University students. The Chancellors’ Scholarship is awarded in recognition of demonstrated academic achievement, leadership and overall potential. The scholarship will be awarded to one top incoming student in each degree program, and can be awarded in conjunction with other types of merit-based and need-based scholarships.

Fubon Scholarship
The Fubon Scholarship was created by the Fubon Group, an early supporter of the iMEP Program at Duke Kunshan. The scholarship aspires to groom innovative, skilled agents of change who can offer workable, highly impactful solutions for addressing the world’s most pressing environmental dilemmas and creating a profound, lasting impact on environmental sustainability.

Green Future Fund
The Green Future Fund was established in 2018 by Ms. Ma Lin, an important supporter of the iMEP Program at Duke Kunshan. Ma Lin and Duke Kunshan University share a vision of achieving a sustainable future by educating the next generation of environmental leaders; producing evidence-based, influential research; and cultivating socially and environmentally responsible entrepreneurs. The mission of the Green Future Fund is to provide dedicated financial support for Duke Kunshan University in contributing to a sustainable future in China and beyond.

Guo Tingting Scholarship
All graduate program applicants from developing countries demonstrating financial difficulties will be considered for the scholarship.

Jasmine Jiangsu Government Scholarship
The Jiangsu Provincial Government has set up the "Jasmine Jiangsu Government Scholarship" for international students. At Duke Kunshan University, this scholarship will be provided to those excellent international graduate students.

Need-Based Financial Aid
Citizens of People’s Republic of China are eligible to apply for need-based financial aid if their family financial situation meets the criteria set by Duke Kunshan University. US citizens may apply for need-based financial aid through Duke University by completing the FAFSA. Loan funds are provided through the Federal Direct Unsubsidized and Graduate PLUS programs.

Work-Study Opportunity at Duke Kunshan

Resident Assistant
Resident Assistants (RAs) and Graduate Resident Fellows (GRFs) are student leaders who live on the residence hall floor and serve as a primary resource for students, providing peer help on academic, social, and personal issues; ensuring the health and safety of residents; and building a positive community within the residence hall. The RA position is for one semester, while the GRF position is for one academic year. RAs and GRFs receive training on topics of student development theories, roommate conflict resolution, preventive
mental health, programming, assessment, community building, leadership and teamwork. Currently, all RAs and GRFs receive single-room housing remuneration for their work. For more information on applying, visit dukekunshan.edu.cn/en/student-life/residence-life#leadership-opportunities. Questions about RA should be addressed to residencelife@dukekunshan.edu.cn.

**Student Workers**

Students enrolled in a Duke Kunshan degree program can work on campus on a variety of activities, from research assistantship to administrative operations. The maximum working hours of the student workers is 40 hours/month. The payment varies depending on the grades of students and type of work. International students may get positions as student workers.
Academic Policies

Credit Hour Requirements

iMEP students are required to enroll each fall and spring term from matriculation until graduation as a full-time student for a period of four semesters. During each of these four semesters, students must maintain a course load of at least 12 credits, for a total of 48 credits. Taking more than 15 credits per semester is considered a credit overload, and requires the approval of the iMEP Director of Graduate Studies (DGS). Students who have overloaded on credits during one semester may receive approval from the DGS to underload on credits during a subsequent semester. In making such a determination, the DGS will take into consideration a student’s overall performance in the program, GPA, and course workload. Under normal conditions (e.g., those in which a student has not previously overloaded on course credits), students are strictly prohibited from underloading course credits, except under extenuating circumstances and only with the express approval of the DGS. Violation of this prohibition may result in the student being placed on academic probation.

Course Withdrawal

If a course must be dropped for any reason, students are encouraged to do so within the official drop/add period for a given semester. If a course must be dropped after the official Drop/Add period ends for a given semester, the student must formally withdraw from the course by contacting the iMEP DGS and the DKU Registrar’s Office (dku-registrar@dukekunshan.edu.cn). All withdrawals will be noted on the student’s record with a grade of W (withdrew from course).

Study Away Semester at Duke

iMEP students will have the option to study away at Duke the spring semester of their second year. While at Duke the students will enroll in the first semester of their MP course and three electives chosen from the Sanford School of Public Policy or the Nicholas School of the Environment. Students are limited to only three elective courses unless they receive approval from the director of the program. Students will register for courses at Duke during the graduate student registration window during the previous fall semester. iMEP students may also register for courses outside of the Sanford and Nicholas schools by following the same registration policies laid out by the MPP Program. iMEP students will receive registration service and support through the iMEP Program coordinator at Duke.

Grades

Grades in the iMEP Program are as follows: A, B, C, F, I, X, Z, and W.

I (incomplete) indicates that some portion of the student’s work is lacking, for an acceptable reason, at the time the grades are reported. The student and instructor should coordinate a timeline for submission of the missing work to resolve an incomplete (I), not to exceed one year from the completion of the term for which the incomplete (I) was awarded. If the student does not satisfy the requirements within the agreed-upon timeline, the incomplete (I) will become part of the student’s permanent academic record. Program or continuation fees may be assessed for students who must register for an additional semester to resolve an incomplete.

The grade of X indicates that a student has missed the final examination for a course and must make it up by the end of the fifth week of the following semester to receive a grade for the course.

The grade of Z indicates satisfactory progress at the end of the first semester of a two-semester course. For graduate students enrolled in the summer session, a temporary I for a course may be assigned after the student has submitted a written request. If the request is approved by the instructor of the course, then the student must satisfactorily complete the work prior to the last day of classes of the subsequent summer term.

A grade of W indicates that the student officially withdrew from the course.

A grade of F in a core course normally occasions withdrawal from a degree program not later than the end of the ensuing semester or term; a grade of F in any other course occasions at least academic probation.

A grade of C or lower in a core course may result in the student being required to re-take the course in a subsequent academic term. The DGS will review the student’s overall academic performance and progress toward meeting iMEP degree requirements and will confer with the course instructor to determine whether such a re-take is warranted. To be certified as making satisfactory progress toward the degree, graduate students must maintain at least a 3.0 (B) cumulative grade point average. Students falling below this average jeopardize not only their financial support, but their continuation in the program.

For students in mainland China that have the capability of attending iMEP classes in person, all classes will be evaluated on a letter grade (A-F) basis. For students who are unable to enter mainland China and attend iMEP classes in person, but who have opted to participate in classes via online platforms, class evaluations may be on a pass/no-pass basis. To avail this option, students must submit...
a written request to the course instructor no later than the halfway point for the semester in which the student is enrolled.

**Academic Standing**

To remain in good academic standing, and to graduate from the iMEP Program, students must maintain at least a 3.0 (B) cumulative grade point average. Students must also demonstrate satisfactory progress in research and related activities beyond coursework. Students falling below the 3.0 average jeopardize their financial support and are subject to dismissal. A failure to maintain good academic standing, for whatever reason, will result in the student being placed on probation for one semester. If the student has not regained good academic standing by the end of that semester, the student may be dismissed from the program without receiving a degree.
Doctoral Programs

The PhD prepares students most commonly for careers in academia. In more recent years, students earning their doctorate from the environmental programs at Duke have gone on to have satisfying careers in consulting, business, government and other arenas that allow them to apply their knowledge. Doctoral students emphasize scholarly research as a major part of their degree programs though a growing number of students focus their research on those areas with direct practical applications. An active research program is a vital component of the Nicholas School of the Environment, and most of the research projects in the school utilize PhD candidates as research assistants. The Nicholas School does not normally consider applications for the MS, although some students may be awarded an MS as part of a doctoral program.

A majority of faculty in the Nicholas School are members of the faculty of The Graduate School and are actively involved in the training of doctoral (PhD) students in the fields of earth and ocean sciences, marine science and conservation, environmental, and toxicological sciences. Prospective students should contact individual faculty mentors prior to applying to the doctoral program to ensure mutual interests in research topics. Policies and procedures for admission and registration, academic regulations and requirements for the PhD are given in detail in the bulletin of The Graduate School and not repeated in detail here.

Doctoral students are admitted to work with Nicholas School faculty by direct application within The Graduate School via four pathways: 1) application in the subject areas environment, earth and ocean sciences, or marine science and conservation; 2) application to the Integrated Toxicology & Environmental Health Program (ITEHP), also known as the University Program in Environmental Health (UPEH); 3) application to the University Program in Ecology (UPE), with an advisor chosen from within the Nicholas School faculty; or 4) application to the University Program in Environmental Policy (UPEP), with an advisor chosen from within the Nicholas School faculty.

Environment (ENV)
The Environment (ENV) Program is one of several programs at the Nicholas School that offer a PhD. Major and minor work for the environment graduate program is offered through the environmental sciences and policy division of the Nicholas School of the Environment. The research emphasis of the environmental sciences and policy division is in the areas of ecosystem science and management, environmental chemistry and toxicology, aquatic and atmospheric sciences, and environmental social sciences. Applicants are strongly encouraged to contact the individual faculty member under whose supervision they are interested in pursuing graduate study. Direct inquiries to dgsa@nicholas.duke.edu. Information about the program and the faculty can be found at nicholas.duke.edu/academics/doctoral-programs/environment-env.

Earth and Climate Sciences (ECS)
The Earth and Climate Sciences (ECS) PhD Program offers research opportunities in three broad areas of geoscience: biogeosciences, oceans and climate, and earth resources. Biogeosciences in ECS focuses on the interactions between life, water and landscapes including coastal ecomorphodynamics and remote sensing, watershed ecohydrology, and landscape evolution including that of coupled human-landscape systems. Oceans and climate research in ECS includes ocean circulation, atmospheric dynamics, paleoclimatic/paleoenvironment reconstruction, marine biogeochemistry, and ocean/atmosphere interactions, particularly as they relate to global climate change. And research in earth resources addresses the geologic formation and human use of mineral, energy, water, and land resources, including mineral formation, life-cycle analysis, energy consumption/emissions, water quality as it relates to human health, and the role of technology in the Anthropocene.

A student in the PhD program may elect to get an MS degree while working toward the PhD. If this option is elected, the requirements are the same as for the MS program in terms of coursework, time limits, and thesis requirements. Direct inquiries to dgsa@nicholas.duke.edu. More information about the program and the faculty can be found at nicholas.duke.edu/academics/doctoral-programs/earth-climate-sciences-ecs.

Marine Science and Conservation (MSC) Doctoral Study at the Duke University Marine Laboratory

Duke Marine Laboratory (DUML) campus is located in the coastal town of Beaufort, NC, situated 180 miles from the main Durham campus. DUML is home to the Marine Science and Conservation (MSC) PhD Program established in 2008 with an interdisciplinary, research-focused, five-year program with an emphasis on both natural and social sciences. Faculty research in the MSC Division is focused on oceanography, marine biology, marine biomedicine, marine biotechnology, and coastal and marine policy and management. Faculty and students study the biology of marine species, address global-scale marine issues, and use advanced technologies, analysis, and modeling that allow science and policy to be evaluated across space, time and disciplines.

MSC doctoral students typically spend the first two semesters taking graduate classes on the Durham campus before moving to
Cooperative University Programs

Integrated Toxicology & Environmental Health Program (ITEHP)

The Integrated Toxicology & Environmental Health Program (ITEHP) provides students with the theoretical and practical bases for research, employment, and teaching in toxicology. This interdepartmental program brings together graduate students, postdoctoral fellows, and faculty members from a variety of scientific disciplines to address exposure, toxicological and associated environmental health problems from their molecular basis to clinical and environmental consequences. The ITEHP includes participation of faculty members from the departments of biochemistry, cell biology, chemistry, engineering, neurobiology, pathology, pharmacology and cancer biology, and the Nicholas School of the Environment, including the Duke University Marine Laboratory. Among the principal areas of concentration in the program are neurotoxicology and neurological disease, epigenetics, genetic toxicology, cancer, developmental toxicology and children’s health, environmental exposure and toxicology, and pulmonary toxicology and disease. Duke faculty members have a variety of collaborative research efforts and, in some cases, student rotations are available with scientists at the nearby laboratories of the National Institute of Environmental Health Sciences (NIEHS), and the Environmental Protection Agency (EPA).

Application to the program can be made in one of two ways:

1. **Direct Admission:** If a student’s primary interest is toxicology, then they may apply for admission directly through the ITEHP. Applicants should indicate their Intended Degree on their Graduate School application as “PhD. (Biomedical Sciences Programs – School of Medicine)” and their Department/Degree as “Integrated Toxicology and Environmental Health –Ph.D.” Students admitted directly into the program affiliate with a degree-granting department (including various PhD programs in the Nicholas School of the Environment, Pratt School of Engineering, or School of Medicine) depending upon their choice of research mentor, typically at the end of their first year. Students directly admitted to ITEHP are awarded a full fellowship (tuition, fees, and stipend), and these training grant fellowships are restricted to US Citizens or Permanent Residents only. Non-US Citizens who are interested in ITEHP must apply via Option #2 below through a participating department and pursue the ITEHP certificate.

2. **Certificate Option:** Students who do not meet direct-admission requirements or those with a primary interest in a departmentally-based field may also apply to the ITEHP by selecting their primary program of interest (e.g. “Environment – Ph.D.”) on their graduate school application, then entering “ITEHP Certificate” in the “Area(s) of Interest” field on the graduate school application. In addition, these students must send an email to ITEHP@duke.edu in order to indicate interest in the ITEHP certificate. (It is also possible for PhD students to add the ITEHP certificate option after they matriculate. Contact the program for more details.)

There is no difference in the eventual degree granted through either mechanism; both routes result in a PhD granted by a specific department, with certification in toxicology.

Complete program details and contact information can be found at nicholas.duke.edu/academics/doctoral-programs/university-program-integrated-toxicology-and-environmental-health-itehp. Further information may be obtained from the ITEHP Program at ITEHP@duke.edu.

University Program in Ecology (UPE)

Duke hosts strong research programs in ecology, with highly productive faculty from a number of departments working at all levels of biological organization—from the organism to the ecosystem. Areas of special strength include global change ecology, evolutionary ecology, and forest and marine ecology.

The University Program in Ecology was formed in 2000 to provide a common home for students who are pursuing doctoral studies in ecology in various departments across the University, including many students in the Nicholas School.
Students are admitted for doctoral work in the University Program in Ecology through The Graduate School. Departments participating in the ecology program guarantee that any student admitted is automatically admitted for PhD study in the home department of the student’s major professor.

The University Program in Ecology admits students with the promise of two years of financial support from the program, followed by support from the department of the student's selected major advisor. Students are supported for up to five years of doctoral study if they maintain satisfactory progress toward their degree.

Students seeking admission to the University Program in Ecology should file an application with The Graduate School, specifying consideration by the UPE or one of the participating departments. Direct inquiries to dgsa@nicholas.duke.edu. Find more information at nicholas.duke.edu/academics/doctoral-programs/university-program-ecology-upe.

University Program in Environmental Policy (UPEP)
The University Program in Environmental Policy was established in 2009 and is jointly administered by the Nicholas School and the Sanford School of Public Policy. It is the first and only PhD program in the United States jointly administered by a school of the environment and a school of public policy. It is a multidisciplinary, research-focused five-year doctoral degree, intended to prepare candidates for positions in applied academic departments and professional schools (e.g., environment and natural resources, public policy, public administration, international affairs), domestic and international public agencies, and environmental organizations, research institutes, and policy-consulting firms. Although the program is multidisciplinary, it is designed to ensure that students have strength in a particular social science discipline. Students designate their concentration when applying and currently may select either environmental economics or environmental politics.

The University Program in Environmental Policy provides a focal point for faculty and graduate students in the Nicholas School and Duke University’s Sanford School of Public Policy who are interested in environmental policy. It draws on the intellectual resources of not only the two schools but also related disciplinary departments (economics and political science) and other professional schools (Duke Law School, The Fuqua School of Business, Pratt School of Engineering) at Duke. Faculty in the program conduct research on economic and political aspects of a wide range of topics, including air and water quality, biodiversity conservation, climate change, community resource management, corporate sustainability, ecosystem services, energy, environmental health, fisheries, forests, and freshwater and marine resources, in both US and international contexts. Applicants are encouraged to contact faculty members with related interests to learn more about their current research projects and interest in accepting new doctoral students.

Students seeking admission to the University Program in Environmental Policy should file an application with The Graduate School, specifying consideration by the UPEP. Direct inquiries to dgsa@nicholas.duke.edu. Further information on the University Program in Environmental Policy can be found at nicholas.duke.edu/academics/doctoral-programs/university-program-environmental-policy-upep.

Graduate School Registration
Students in PhD programs initiate course registration through the directors of graduate studies of the Nicholas School (in Earth and Climate Sciences, Environment, University Program in Ecology, University Program in Environmental Policy, and University Program in Integrated Toxicology and Environmental Health) and/or their advisor/s. Registration for courses is completed through the student online registration system (DukeHub). Registration requirements and procedures are described in the bulletin of The Graduate School, the department/program websites and in consultation with faculty advisor(s).
Admissions

Applicants for the PhD must use The Graduate School's electronic application, available at gradschool.duke.edu/admissions. An individual faculty member in the Nicholas School (or other schools at Duke University, in the case of the University Programs) must accept responsibility to advise an applicant before admission can be offered (this is not necessarily the case for ITEHP though students should contact faculty ahead of time); thus, students applying to the doctoral programs are strongly encouraged to correspond with prospective faculty advisors and visit the campus. Brief summaries of individual faculty research interests are given with the faculty listing in this bulletin.

Qualification of Students

Students seeking admission to The Graduate School must have earned an AB or BS degree (or the equivalent in the case of foreign students) from an accredited institution. Usually the student should have majored in the area of intended graduate study or one closely related to it. Because research is such an integral part of doctoral education in the Nicholas School, the student’s undergraduate record must evidence the capability, motivation, and commitment to conduct independent study and research at an advanced level.

Special Admissions Information for Cooperative University Programs

Integrated Toxicology & Environmental Health Program (ITEHP)

ITEHP is an admitting program and a certificate program. Applications to the program can be made in two ways. There is no difference in the eventual degree granted through either mechanism; both routes result in a PhD granted by a specific department, with certification in toxicology.

1. Direct Admit: If a student’s primary interest is toxicology, then they may apply for admission directly through the ITEHP. Students admitted directly into the program affiliate with a department depending on their choice of research mentor, typically at the end of their first year. The direct-admit option is funded by an NIEHS Training Grant and is thus only available to US citizens or legal permanent residents; applicants who do not meet this requirement can apply through the certificate option below.

2. Certificate Option: Students who do not meet direct-admit requirements or those with a primary interest in a departmentally-based field may also apply to the ITEHP by selecting their primary admitting unit as the specific graduate department (e.g., School of the Environment, Engineering, Medicine), and entering “ITEHP Certificate” in the “Area of Interest” field on the graduate school application. In addition, these students must send an email to ITEHP@duke.edu in order to indicate interest in the ITEHP certificate. (NOTE: It is also possible for students to add the ITEHP certificate option after they matriculate. Contact the program for more details).

Interested prospective students will find complete program details and contact information at nicholas.duke.edu/academics/doctoral-programs/university-program-integrated-toxicology-and-environmental-health-itehp. Further information may be obtained from the ITEHP Program, 919-613-8078; ITEHP@duke.edu.

University Program in Ecology (UPE)

Students are admitted for doctoral work in the University Program in Ecology through The Graduate School. Departments participating in the ecology program guarantee that any student admitted is automatically admitted for PhD study in the home department of the student’s major professor.

The University Program in Ecology admits students with the promise of two years of financial support from the program, followed by support from the department of the student’s selected major advisor. Students are supported for up to five years of doctoral study if they maintain satisfactory progress toward their degree.

Students seeking admission to the University Program in Ecology should file an application with The Graduate School, specifying consideration by the UPE or one of the participating departments. Direct inquiries to dgsa@nicholas.duke.edu. Find more information at nicholas.duke.edu/academics/doctoral-programs/university-program-ecology-upe.

University Program in Environmental Policy (UPEP)

Students seeking admission to the University Program in Environmental Policy should file an application with The Graduate School, specifying consideration by the UPEP. Direct inquiries to dgsa@nicholas.duke.edu. Further information on the University Program in Environmental Policy can be found at nicholas.duke.edu/academics/doctoral-programs/university-program-environmental-policy-upep.

Applicants are encouraged to contact faculty members with related interests to learn more about their current research projects and interest in accepting new doctoral students.
Financial Assistance

Students in all of the doctoral programs are normally supported for up to five years of study if they maintain satisfactory progress toward their degree. Some students receive fellowships to support their studies, while others are employed as teaching assistants, receiving a stipend and fellowship that cover tuition and fees. Other students are employed as research assistants, with funding derived from research grants managed by their major professor. In recent years, a significant fraction of the doctoral students have also been successful in national competition for graduate fellowships from the National Science Foundation, National Aeronautics and Space Administration National Oceanic and Atmospheric Administration, and other agencies.

Normally, students are supported on teaching assistantships for only two or three years of their graduate study, the balance by research assistantships and/or fellowships. Students supported on teaching or research assistantships may also receive support for up to three summer months from research funding. ITEHP students are funded fully through the NIEHS Training Grant for the first two years of study; then, the above is true for the remaining time.

Fellowships Offered through the Nicholas School

W. D. Billings Fellowship. The University Program in Ecology awards the W. D. Billings Fellowship to an entering doctoral student who plans to specialize in some area of plant ecology. The award covers all tuition and fees and provides a full stipend for the first year of graduate study. The fellowship was established by Shirley M. Billings in honor of her husband, the late W. Dwight Billings, a physiological plant ecologist at Duke for more than thirty years who was renowned for his work in arctic and alpine environments.

Rachel Carson Fellowship. Established by William C. Powell, Thomas E. Powell Jr. and friends, the Carson Fund provides fellowships to PhD candidates who use the Rachel Carson Sanctuary site in Beaufort, North Carolina, as a major component of their research. First consideration will be given to PhD students in residence at the Duke University Marine Laboratory.

Robert W. Safrit Jr. Fellowship. Established by Robert W. Safrit, this fellowship is for students at the Duke University Marine Laboratory.

Harvey W. Smith Graduate Fellowship. Established by Evelyn Chadwick Smith, the Harvey W. Smith Graduate Fellowship Endowment provides fellowships to doctoral candidates in marine science.

Dr. Larry Widell Memorial Fellowship. Established by Christopher M. Widell, this endowment provides fellowships to Nicholas School students, with preference given to doctoral candidates.

Fellowships Offered through The Graduate School

The Graduate School offers a number of campus-wide competitive fellowships and scholarships. The James B. Duke Fellowships and University Scholars Program are available to incoming doctoral students in all departments. Advanced students may apply for the Katherine Stern Fellowship, which provides dissertation-year support. They are also eligible for conference travel awards and for a variety of other special internships or fellowships. The Graduate School also provides a number of awards for international research travel for doctoral students.

Minority doctoral students may receive support from the Dean's Graduate Award Fellowships and Presidential Fellowships or through the National Consortium for Graduate Degrees for Minorities in Engineering and Science Inc.

The Frederick K. Weyerhaeuser Forest History Fellowship is given annually by the Forest History Society to a Duke University graduate student who wishes to study broadly in the area of forest and conservation history.

For detailed information about campus-wide financial aid opportunities for doctoral students, including application procedures, please consult the bulletin of The Graduate School.

National, Regional, and Foundation Awards

In addition to those awards available through the Nicholas School or the university, students are urged to compete for national and foundation awards for graduate study. Of particular interest to doctoral students in the Nicholas School are National Science Foundation Graduate Fellowships and Minority Fellowships and NASA Doctoral Fellowships. The websites of these agencies offer details on applying for these fellowships.

Teaching Assistantships

Each year a selected number of PhD candidates may be offered a financial aid package consisting of full tuition plus a monthly stipend. The monthly stipend requires up to 19.9 hours of work per week during the nine-month academic year. Students receiving these stipends are assigned by the director of graduate studies to serve as teaching assistants for various faculty or courses.
Duke University

Research Assistantships

Funded from grant and contract research under the direction of various members of the faculty, research assistantships provide support during the course of study of the PhD candidate. Typically, the research assistant completes one or more phases of a research project under the direction of the principal investigator, a member of the faculty. Normally, the research completed forms a substantial component of the requirements of the PhD dissertation. However, in some instances students may pursue dissertation research in an unrelated area of study.

The academic year stipend is salary for research involving up to twenty hours per week. A regular schedule of research under the direction of the principal investigator must be maintained; therefore, some research assistantships require full-time service during the summer.
K-MEP-MEP - International Master of Environmental Policy

**Program Summary**

**Title**
International Master of Environmental Policy

**Degree Designation**
MEP - Master of Environmental Policy

**Type**
Primary

**Overview**

The Sanford School of Public Policy and the Nicholas School of the Environment (NSOE) offer a two-year International Master of Environmental Policy (iMEP) program based at the Duke Kunshan University campus in Kunshan, China. The iMEP Program offers a highly analytical and multidisciplinary master’s degree based on the Duke Master of Public Policy (MPP) and Master of Environmental Management (MEM) programs. With an emphasis on both international and Chinese experience and contexts, the iMEP combines a world-class faculty, a cutting-edge research center, an innovative curriculum, and unparalleled career opportunities.

Duke Kunshan University’s iMEP Program prepares its graduates to meet the pressing environmental and economic challenges facing the international community through effective policy solutions by drawing from an array of disciplines. The core curriculum combines economics, science, law and governance, policy, and program evaluation. The program is four semesters and includes sixteen courses for a total of 48.0 graduate course credits. The program allows Duke Kunshan University students to spend their third semester at Duke. In their second year, iMEP students complete a client-based or quantitative research master’s project in partnership with an academic advisor.

The iMEP Program simultaneously creates a one-semester study away opportunity for Sanford MPP/MIDP and NSOE MEM/MF students, who may travel to Duke Kunshan University in their third semester. Duke and Duke Kunshan faculty may participate in a similar exchange.

More information about the iMEP program is available on the following pages of the bulletin: Admissions, Tuition & Fees, Financial Aid, and Academic Policies.

**Requirements**

**Free Form Requirements**

The curriculum for the iMEP degree consists of sixteen courses (48.0 course credits) spread out over two years. Students will be required to take seven core courses (21.0 course credits) to ensure quality and consistency in the degree. They will also be required to enroll in a full year of the master’s project class (MP, 6.0 course credits). Unlike the traditional MA programs in China, the iMEP Program does not offer a thesis option but a capstone project. There will be flexibility with the seven elective courses (21.0 course credits) to allow students to pursue particular environmental policy and resource issues as well as enhance their methodological skills. Finally, students will have the opportunity to complete a summer internship, ideally connected to their MP. The curriculum includes:

- Two-week Boot Camp the summer prior to first semester
- Seven core courses (21.0 course credits)
- Seven elective courses (21.0 course credits)
- Two MP capstone courses (6.0 course credits)
- Summer Internship

The program includes a statistics and economics prerequisite. Students are required to take two examinations prior to enrollment to ensure that they have the appropriate skills in statistics and economics. If the student does not pass the examination, they will take an online class prior to enrollment and take refresher courses during the two-week Boot Camp the summer before their first semester.

This program also administers an English reading and writing examination prior to enrollment. Because iMEP is an English-only program, students will need to be screened for language before they can enroll. For students that need additional support in writing, they will be required to enroll in one of the English-language courses offered through the writing program at Duke Kunshan University (in addition to their 48.0 credits). For students whose native language is not Chinese, the Language and Culture Center at Duke Kunshan University provides different levels of Chinese courses. Chinese coursework is entirely optional, does not confer credit, and must be taken in addition to the required coursework. In addition to a weekly introductory course for graduate students, independent language study with a support coach is available for students with some previous Chinese experience.
Core Courses

- ENVIRON 805K. Environmental Economics (Year 1 Fall)
- PUBPOL 870K. Statistics and Program Evaluation (Year 1 Fall)
- PUBPOL 871K. Environmental Policy Analysis (Year 1 Fall)
- ENVIRON 718K. Environmental Sciences (Year 1 Spring)
- PUBPOL 872K. Environmental Economics Policy Practicum (Year 1 Spring)
- ENVIRON 803K. Environmental Policy Process (Year 1 Spring)
- ENVIRON 835K. Environmental Law (Year 2 Fall)

Electives

Below are electives that have been taught by iMEP faculty, adjuncts, or visiting Duke faculty. Not all electives will be offered each year. These are just samples of the classes that could be offered. The program may interest Duke faculty outside of the Nicholas School of the Environment and Sanford, including those who teach history, engineering, law, and sociology, for example. As the program develops, it will continue to provide additional course offerings.

- Air Quality: Management
- Applied Environmental Valuation Methods
- Building an NGO Toolkit
- Environmental Impact Evaluation
- Climate Change Law and Policy
- Climate Change Economics and Policy
- Fundamentals of Geospatial Analysis
- Environment and Development Economics
- Energy Economics and Policy
- Business Strategy and the Environment
- Key Areas in International Environmental Policy
- Independent Study
- Natural Resources and Protected Area Management
- Environmental Science Research Methods
- Economics and Policy (Crosslisted in Global Environmental Health)

Master's Project Capstone

MP Capstone Class (Year 2 Fall and Spring) – The master's project (MP) is a 8,500-11,500-word, single-spaced paper, policy memo, or journal article required of all master’s students in the iMEP Program. Two types of projects are possible: a project for an actual client that involves a variety of methodological approaches (Client-based), or a project based on quantitative methods that may or may not have an actual client (research-based). Hybrids of these projects are also possible. Students are encouraged to build their projects from their summer internships where possible and to deepen their policy-area expertise by taking appropriate elective courses.

Research-Based Projects

This type of MP more closely resembles a thesis. Research MPs follow the standard format for scientific research—abstract, introduction, methods, results, and discussion—and introduce a brand new idea or theory, and may involve original field data collection. Students interested in a doctoral degree or employment in research roles may benefit from this type of MP. Working with the MP advisor, the student needs to follow scientific methods in their topic area. The research topic must be relevant to environmental policy, and involves rigorous quantitative and/or qualitative methodology. If analysis involves using data with human subjects, then students may need the Duke Kunshan University IRB to review and approve their protocol. Research MPs should be of publishable quality, although they do not need to be published.

Client-Based Projects

This type of MP is designed to help a client decide what to do about an environmental policy problem. The purpose is to recommend a specific course of action. This project must also measure up to standards of good analysis, including a clear definition of the problem and careful evaluation of the relevant evidence, identification of important trade-offs, and identification of conclusions and recommendations. The student needs to identify a client or a policy problem as the first step. This project could follow from the summer
internship, or an organization that the student would like to work with in the future. The student will conduct initial research into a general policy problem, then conduct relevant research to identify the specific policy problem. To be approved as a MP topic, the client must have a significant policy problem posed in the form of “What should the client do?” Students are encouraged to turn their MP into a case study for teaching purposes.

**Process for Completing the Project**

In the spring semester of their first year, iMEP students should start the process of identifying a client, and a policy problem to address. By April 1, students must submit an MP Advisor Application form to the iMEP Program director. The MP advisor must be iMEP faculty with a primary appointment at Duke Kunshan University, or from Duke University with a secondary appointment at Duke Kunshan University. By April 31, students should have met with their MP advisor and must sign an MP agreement containing the title and a succinct presentation of the MP project, which will be submitted to the iMEP Program coordinator at Duke Kunshan. If the MP is a client-based project, an acceptance letter or email from the client should be provided with the MP agreement. If the project involves human subjects, then the student should begin the IRB process as soon as possible. Students should check with their employer whether there is a confidentiality clause and if data from the internship can be stored in the public domain.

In their second year, all iMEP students enroll in the required fall and spring MP courses. The course syllabus will provide a deadline in early September for a statement of intent and a deadline for changing the MP advisor. The fall term course is designed to help each student conceptualize their project, to provide guidelines related to applied research (IRB procedures and study design) and to complete a prospectus that will be due to the MP I instructor by late November and the MP advisor by the end of the semester.

For most students, the spring semester of their second year will take place at Duke University in Durham, where the iMEP faculty lead Jackson Ewing will teach the MP II course. It is recommended that the student complete all data collection before the beginning of their last semester. Students will maintain long-distance communication with their advisor if they are based at Duke Kunshan University. The first draft is due to their MP advisor in late March of the final semester. The final copy is due in April of the final semester. The final copy must be submitted in electronic (PDF) format to Yitian Gu at yitian.gu@dukekunshan.edu.cn. The student must also get an electronic Master's Project Submission form signed by their MP advisor by the date specified on their Master's Project II syllabus. A final master's defense involving a presentation and Q&A with all students and MP advisors present will be scheduled after the final copy due date and before graduation.

**Grading of the MP**

The MP advisor reviews the final MP and attributes one of the following grades: credit or no credit. If a student disagrees with the decision of the advisor, they can make a reasoned appeal of this decision to the director of graduate studies. In this case, an appeal committee consisting of the MP advisor and an ad hoc group of faculty members selected by the director of graduate studies makes a final decision on the MP grade.
N-BE-MEM - Master of Environmental Management - Business and Environment

Program Summary

Title
Master of Environmental Management - Business and Environment

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview

The Business and Environment (BE) Program provides students with training on the challenges that private sector organizations face in engaging with the natural environment. Students learn about business organization, the fundamentals of finance, and how multinational firms and small and medium enterprises address environmental, economic, and social sustainability imperatives. The BE curriculum enables students to customize their educational experience to meet their interests and career goals, whether they involve a focus on supply chains, natural resource finance, compliance, consulting, strategy, or product innovation.

Students take a series of required and elective courses to gain foundations to incorporate analytical tools to evaluate environmental and economic trade-offs of both organizational and technological innovations. Students also gain hands-on experience through client-based consulting projects. These projects leverage tools such as financial, strategic, and life-cycle analysis in preparation for a career focused on the unique role businesses play with respect to the environment.

Prerequisites: calculus, statistics, and microeconomics (or general economics that focuses on microeconomics rather than macroeconomics) required.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/business-environment.

Requirements

Free Form Requirements

Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-CBM-C - Certificate - Community Based Environmental Management

Program Summary

Overview
Community-Based Environmental Management (CBEM) involves communities becoming empowered to manage their own environment in ways that are economically viable, socially just and environmentally sustainable. The CBEM Certificate Program provides students with the theory and methods that will allow them to identify the potential problems and pitfalls commonly associated with CBEM initiatives, both domestically and internationally, along with the tools necessary to create and manage their own projects.

Nicholas School students enrolled in the Master of Environmental Management (MEM) or Master of Forestry (MF) degree programs are eligible to participate in the certificate program. Students who wish to pursue this certificate program should add the program through their Stellic account.

Requirements

Free Form Requirements
Students wishing to earn a certificate in Community-Based Environmental Management will be required to complete a total of 12 credits of core and advanced courses. It is expected that most or all certificate components can be used to fulfill other graduate degree requirements (e.g., program-specific course requirements or other electives).

Specific courses eligible to fulfill the requirements of this certificate are available here: nicholas.duke.edu/academics/certificate-programs/community-based-environmental-management-certificate.

- ENVIRON 755 Community-Based Environmental Management (3 credits)
- ENVIRON 795 Practicum in Community-Based Environmental Management (3 credits)
- Theory and Methods Course (3 credits)
- Application Course (3 credits)
- Related Master's Project
N-CCS-C - Certificate - Climate Science and Applications

Program Summary

Title
Certificate - Climate Science and Applications

Degree Designation
CER - Certificate

Type
Certificate

Overview
The Nicholas School's Climate Change Science and Applications (CCSA) certificate program is open to all Master of Environmental Management (MEM) and Master of Forestry (MF) students. To earn the certificate, students must complete 12 credit hours of required coursework in physical or natural science, social science, and integrated assessment modeling, as well as a climate-related elective specific to their individual concentration area. They also must demonstrate mastery of skills learned through these courses by applying them in their Master's project or another equally substantive faculty-supervised capstone research project.

Students who wish to pursue this certificate program should add the program through their Stellic account.

Requirements

Free Form Requirements
The courses are in three required categories, and in some categories there are various courses that can be used to meet the requirements. Lists of recommended courses in each category are available at nicholas.duke.edu/academics/certificate-programs/climate-change-science-and-applications.

- Natural/Physical Science: 1 course
- Social Science: 1 course
- Modeling: 1 course
- Elective: 1 course
# Program Summary

**Title**
Master of Environmental Management - Coastal Environmental Management

**Degree Designation**
MEM - Master of Environmental Management

**Type**
Primary

## Overview

The Coastal Environmental Management (CEM) Program provides a scientifically rigorous understanding of global, national, and local physical and biological coastal environments and processes and the human behaviors and policies that affect, and are affected by, those environments and processes. The specific aim of the program is to train scientifically informed professionals to fill coastal policy and management, research or advocacy positions in federal, state, and local agencies, industry, consulting firms, and nonprofit organizations. The program also provides a firm foundation for future PhD studies.

The first year of the program is spent on the Durham campus fulfilling the required courses in areas such as natural resource economics, general environmental policy, ecology, oceanography, and methodological skills. The second year is usually spent in residence at the Marine Lab in Beaufort, taking courses in the natural, social, and policy sciences specific to the coastal and marine environment, and focusing on the production of the master’s project. The Marine Lab provides an ideal setting for the study of natural and social scientific phenomena associated with coastal and marine environments, and for interaction with coastal and marine constituencies and policymakers in the application of science to policy. Potential opportunities for participation in the policymaking process are emphasized throughout the program.

Prerequisites: calculus, statistics, introductory microeconomics (or general economics that focuses on microeconomics rather than macroeconomics) required.

For more detailed information about this program, including specific prerequisites and degree requirements, visit nicholas.duke.edu/academics/masters-programs/master-environmental-management/coastal-environmental-management.

## Requirements

**Free Form Requirements**

Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-DEL-MEM - Master of Environmental Management - Environmental Leadership

Program Summary

Title
Master of Environmental Management - Environmental Leadership

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview
The Duke Environmental Leadership Master of Environmental Management (DEL-MEM) focuses on leadership and is designed for mid-career professionals. The DEL-MEM Program’s hybrid (online and place-based) format makes it feasible for professionals to pursue the degree while working full-time.

The DEL-MEM is a two-year, four-semester, thirty-course-credit program designed for mid-career professionals with a minimum of five years of professional experience in an environmental field. The DEL-MEM focuses on interdisciplinary and global themes, strategic approaches to environmental management, communication, and effective leadership. The DEL-MEM degree is offered primarily via distance-learning technologies, and is complemented with five short place-based sessions.

For more information about the DEL-MEM Program, contact nicholas-admissions@duke.edu or (919) 613-8070 or visit nicholas.duke.edu/academics/masters-programs/duke-environmental-leadership-master-environmental-management.

Requirements

Free Form Requirements
The DEL-MEM combines distance-learning courses and short, intensive place-based sessions. The five required place-based sessions give participants an opportunity to experience the campus environment, meet fellow MEM students, interact directly with faculty, and participate in leadership development activities. Including orientation, students are required to come to the Duke campus four times during their studies. They also participate in the hallmark DC Leadership Module in which students convene in Washington, DC, and meet with prominent environmental leaders in all sectors. Between campus visits, and to complement the face-to-face sessions, students complete individual and group coursework online through synchronous sessions and asynchronous discussions.

Prerequisites. Five years of professional environmentally-related experience is a prerequisite for the program. No specific courses are required to apply.

Major (Core) Courses. Core courses are offered in ecosystems science and management, economics of environmental management, environmental law and policy, leadership, and program management for environmental professionals. Other required components include: five place-based intensive sessions (varying from three to six days), a professional writing skills course for first-year students, and a master's project.

Elective Courses. Elective courses, developed around more specialized themes, are offered in the spring semesters and alternate each year. Independent studies and projects and one-credit intensive short courses may also be taken.

Master's Project. A master's project constituting 4-6 course credits is required. These projects take the form of individual or small-group analysis of a problem in natural resource management, offering alternative solutions for better management of the environment. A project related to the student's current employment is recommended, but not required. The results of the master's project are presented orally on campus and in a written document that is approved by the student's advisor before graduation.

For more details on curriculum requirements, see nicholas.duke.edu/academics/masters-programs/duke-environmental-leadership-master-environmental-management.
N-EE-MEM - Master of Environmental Management - Energy and Environment

Program Summary

Title
Master of Environmental Management - Energy and Environment

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview
The Energy and Environment (EE) Program aims to provide students with the skills and knowledge necessary to effectively address energy and environmental challenges. Over the course of the program, students will gain a broad perspective on the current energy system and future alternatives; a fundamental understanding of science and technology as it relates to energy and environment; background in the economics, policy and business of energy; first-hand exposure to the energy sector and energy leaders; critical skills in data analysis and modeling; and experience with communication, facilitation, project management, and teamwork.

Energy use is one of the most complex and multi-faceted problems influencing the future of the environment. Students wishing to complete the energy and environment program will need to complete coursework that addresses energy across multiple disciplines, covering science and technology, economics, business, policy, and law. The program is organized along four broad themes: science and technology, markets and policy, tools, and energy electives. The curriculum requires students to take core courses in these areas and complete the master’s seminar and project.

Prerequisites: calculus, statistics, and introductory microeconomics (or general economics that focuses on microeconomics rather than macroeconomics) required.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/energy-environment.

Requirements
Free Form Requirements

Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-EEH-MEM - Master of Environmental Management - Ecotoxicology and Environmental Health

Program Summary

Title
Master of Environmental Management - Ecotoxicology and Environmental Health

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview

The Program in Ecotoxicology and Environmental Health (EEH) emphasizes interactions among human/environmental health and ecological processes. The program is concerned with the fates, effects, and risks of pollutants to natural ecosystems and human users of those systems both within the United States and internationally. A multidisciplinary program, EEH incorporates the concepts, information bases, and methodologies of toxicology, environmental chemistry, risk assessment, and ecology. This program stresses risk assessment attendant to actions/processes that affect human/environmental health and provides a scientific approach to environmental management. By instilling in the student a science-based approach combining integrated assessment for humans, biota, and natural resources, EEH seeks to produce scientists and environmental managers with a solid foundation in the principles underlying pollutant fates and impacts on ecology and environmental health, as well as a firm grasp of state-of-the-art approaches for evaluating specific instances of environmental contamination and for making management decisions based upon quantitative analysis.

Prerequisites: calculus, statistics, and chemistry required; organic chemistry and ecology recommended.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/ecotoxicology-environmental-health.

Requirements

Free Form Requirements

Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-EEP-MEM - Master of Environmental Management - Environmental Economics and Policy

Program Summary

Title
Master of Environmental Management - Environmental Economics and Policy

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview

The Environmental Economics and Policy (EEP) Program is designed to train decision-makers, those who offer them expert advice, and those who try to influence policy through the political process. The program emphasizes the basic methods needed for analyzing how households and businesses react to existing and proposed environmental and resource policies. The program is highly analytical and is oriented toward the analysis of contemporary national and international environmental problems.

Understanding the effects of markets and institutions on people and the environment requires mastery of three broad areas of knowledge: the basic sciences pertaining to a natural resource or an environmental phenomenon; the relevant disciplines in the social sciences; and the quantitative and qualitative tools required for using knowledge from the physical, biological, and social sciences to arrive at informed decisions. Students choose one of two areas of emphasis: environmental policy analysis, or environmental and resource economics. Four major elective courses and three quantitative courses support the area of emphasis. Three science courses develop a resource area for applying social science analysis, e.g., conservation or water resources.

Prerequisites: calculus, statistics, and microeconomics (or general economics that focuses on microeconomics rather than macroeconomics) required.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/environmental-economics-policy.

Requirements

Free Form Requirements

Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-ESC-MEM - Master of Environmental Management - Environmental Science and Conservation

Program Summary
Title
Master of Environmental Management - Environmental Science and Conservation

Degree Designation
MEM - Master of Environmental Management

Type
Primary

Overview
The Nicholas School offers one overarching ecological program, Ecosystem Science and Conservation (ESC), that focuses on the natural science, policy, and management issues that relate to the stewardship of natural resources. Conservation and ecosystem science are becoming ever more integrated as conservation planning moves to increasingly larger scales and addresses a wider range of resources, from biodiversity to watershed function. For curriculum planning purposes, the program is defined to provide a diversity of alternative perspectives on natural resource ecology and management. The defining feature of the program is a two-dimensional structure, consisting of a focal concentration area and an approach. The concentration defines a topical area or disciplinary specialization. The approach defines a methodological perspective and tool kit. In combination, these choices define a career track and a planning matrix for coursework and research experience for the MEM degree.

Prerequisites: calculus, statistics, and principles of ecology required; and, for some course work, introductory microeconomics (or general economics that focuses on microeconomics rather than macroeconomics); while not a program requirement, some ESC students choose to take the economics courses (ENVIRON520 and 521) for which microeconomics is a required prerequisite.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/ecosystem-science-conservation.

Requirements
Free Form Requirements
Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.
N-FRM-MF - Master of Forestry - Forest Resource Management

Program Summary

Title
Master of Forestry - Forest Resource Management

Degree Designation MF - Master of Forestry

Type Primary

Overview
The Master of Forestry degree integrates forest ecology and management within an educational program that emphasizes related environmental fields. The program builds knowledge in basic forest ecology and ecological management of forests for a variety of uses, including nontraditional forest products and conservation. This distinctive approach is brought about by coordinating a core set of forestry courses in sampling, measurement, dendrology, silviculture and ecology—combined with electives in resource-oriented courses (such as soils, hydrology, air quality, water quality, biological conservation, and physiology); statistical analysis and modeling; and resource economics and policy. The Duke Forest serves as an outdoor laboratory in many of these courses.

The focus of the Master of Forestry is problem solving in complex ecological and management systems. Within the program, students may acquire skills that qualify them for positions in industry, conservation organizations, government agencies, nonprofit organizations, and other groups involved with the use and conservation of forests. The MF Program is accredited by the Society of American Foresters, which is recognized by the Council on Higher Education Accreditation as the specialized accrediting body for forestry educational programs in the United States. Students can develop additional credentials for employment by concurrently completing the MF degree and a master of environmental management degree in the Nicholas School of the Environment or other concurrent degree programs (i.e., business, law, or public policy) at Duke, as described in the section that follows.

Prerequisites: statistics, calculus, principles of ecology, and microeconomics (or general economics that focuses on microeconomics rather than macroeconomics) required.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-forestry.

Requirements
Free Form Requirements

Degree requirements for the MF degree are listed on the Professional Graduate Degree Programs Program Requirements page.
N-GIS-C - Certificate - Geospatial Analysis

Program Summary

Title
Certificate - Geospatial Analysis

Degree Designation	Type
CER - Certificate	Certificate

Overview
Geospatial analyses are a rapidly growing approach to problem solving across a wide array of environmental and earth science disciplines. The Nicholas School's Geospatial Analysis Program develops and maintains:

- Undergraduate and graduate (professional MEM & PhD) geospatial technologies curricula
- Research support for geospatial technologies and analysis
- Professional non-degree, distance learning instruction & certificate programs
- The institutional geospatial technology liaison between the Nicholas School and University

The certificate is open only to degree-seeking students in the Master of Environmental Management and Master of Forestry programs. Students who wish to pursue this certificate program should add the program through their Stellic account.

Requirements

Free Form Requirements
The curriculum is intended to augment the educational tracks of a wide number of students from across the Nicholas School. The Geospatial Certificate requires 3.5 courses from the geospatial curriculum. Information about the courses eligible to fulfill the certificate requirements is available here: nicholas.duke.edu/academics/certificate-programs/geospatial-analysis-certificate-program.

- Fundamentals: 1 course
- Topical Course: 1 course
- Elective: 1 course
- Field Skills Module: 1 course
- Master's Project/Dissertation/Independent Research
N-WRM-MEM - Master of Environmental Management - Water Resources Management

Program Summary
Title
Master of Environmental Management - Water Resources Management

Degree Designation Type
MEM - Master of Environmental Management Primary

Overview
The Program in Water Resources Management (WRM) enables students to understand the physical, chemical, and biological processes—as well as the social contexts—affecting freshwater environments. The program focuses on problems that span the natural divisions of the biosphere, soil, plants, lakes, watersheds, groundwater, and the atmosphere, and teaches quantitative techniques, including measurement and modeling methods used by environmental managers.

The core coursework and training in the WRM Program cover basic physical, chemical, and biological processes relevant to hydrologic sciences, methods of quantitative and statistical analysis, and methods of management and decision-making. Quantitative analysis techniques include mathematical and statistical methods, probabilistic and deterministic models, spatial analysis and modeling, and optimization and simulation methods. Methods for assessing human beliefs, attitudes and behavior, including survey design and analysis, and qualitative methods for analyzing documents and interview transcripts are also useful for water resources management.

Graduates of the program will acquire the skills required to practice as analysts, consultants, regulators, or entrepreneurs concerned with the management and protection of water resources. These employers include government agencies, public utilities, consulting firms, fuel and resource extraction companies, and hydrologic, atmospheric, or environmental research centers, and not-for-profit organizations. Within the WRM Program, students can use their course selection to develop expertise toward a career in: Water Science, Water Management, and International Water.

Prerequisites: calculus and statistics required; microeconomics (not required for WRM but required for ENVIRON 520: Resource and Environmental Economics, a popular course for WRM students); introductory physics and chemistry recommended.

For more detailed information about this program, including specific prerequisites and degree requirements, see nicholas.duke.edu/academics/masters-programs/master-environmental-management/water-resources-management.

Requirements
Free Form Requirements
Degree requirements for all MEM degrees are listed on the Professional Graduate Degree Programs Program Requirements page.

All Courses

ECS701S - Research Orientation Seminar

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
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<tr>
<td>ECS</td>
<td>701S</td>
<td>Research Orientation Seminar</td>
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Description
Introduction to resources, skills, and practices for conducting research in earth and ocean sciences, with emphasis on written and oral communication. Required of all entering graduate students in Earth and Climate Sciences. Consent of director of graduate studies required.

ECS704LA - Biological Oceanography
ECS715 - Introduction to Coastal Environmental Change Processes

Subject: ECS  
Catalog Number: 715  
Title: Introduction to Coastal Environmental Change Processes  
Description: Nearshore physical processes responsible for the evolution of beaches and barrier islands. Various problems and possible solutions arising from human development of retreating shorelines. Involves a field trip and research paper.

ECS716A - Beach and Island Geological Processes

Subject: ECS  
Catalog Number: 716A  
Title: Beach and Island Geological Processes  
Description: Field seminar on the evolution of beaches and barrier islands with emphasis on the interactions between nearshore processes and human development. Prerequisite: Earth and Climate Sciences 315/515 or consent of instructor. Also taught as Earth and Climate Sciences 316A.

ECS722 - Hydrologic and Environmental Data Analysis

Subject: ECS  
Catalog Number: 722  
Title: Hydrologic and Environmental Data Analysis  
Description: Course will focus on acquisition of skills necessary to extract information from observations of hydrological and environmental processes, connect the extracted information with the physical processes generating the data, and estimate physical quantities at ungauged location/times. Emphasis on process understanding via data analysis techniques. Applications used as a way to understand the general concepts, with examples drawn from water science. Prerequisites: Basic computer skills, Algebra, Calculus are required. Experience with computational software (e.g. Matlab or R) is helpful but not required.

ECS723 - Hydrology in Environmental Management
### ECS723D - Hydrology

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<th>Title</th>
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<tr>
<td>ECS</td>
<td>723D</td>
<td>Hydrology in Environmental Management</td>
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</tbody>
</table>

**Description**

An introduction to hydrology by examining how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater with emphasis on hydrological processes inside watersheds. Topic areas include: hydrologic cycle and water balances, evapotranspiration and snow energy balances, vadose zone hydrology, hydrogeology, hyporheic zones, riparian zones, streamflow generation mechanisms, biogeochemical budgets, and field measurement techniques. Linkages between physical hydrology and broader ecological and environmental sciences will be highlighted. Includes local field trips.

### ECS723D - Hydrology

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<tr>
<td>ECS</td>
<td>723D</td>
<td>Hydrology</td>
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</tbody>
</table>

**Description**

An introduction to hydrology by examining how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater with emphasis on hydrological processes inside watersheds. Topic areas include: hydrologic cycle and water balances, evapotranspiration and snow energy balances, vadose zone hydrology, hydrogeology, hyporheic zones, riparian zones, streamflow generation mechanisms, biogeochemical budgets, and field measurement techniques. Linkages between physical hydrology and broader ecological and environmental sciences will be highlighted. Includes local field trips.

### ECS785DS - Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences

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<th>Title</th>
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<tbody>
<tr>
<td>ECS</td>
<td>785DS</td>
<td>Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences</td>
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</tbody>
</table>

**Description**

Analyzing and discussing journal articles about a range of timely topics across the Earth and climate sciences. Each paper is associated with the research to be presented by the upcoming speaker in the Earth and Climate Sciences (ECS) seminar series. Faculty and senior graduate students rotate to provide background lectures needed to understand the paper/seminar, which will expose students to basic concepts from the wide range of research sub-fields represented within the Earth and Climate Sciences program. Meets twice per week, with one class meeting devoted to each ECS seminar (approximately every second week). Consent of director of graduate studies required.

### ECS785S - Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences

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<td>ECS</td>
<td>785S</td>
<td>Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences</td>
</tr>
</tbody>
</table>

**Description**

Analyzing and discussing journal articles about a range of timely topics across the Earth and climate sciences. Each paper is associated with the research to be presented by the upcoming speaker in the Earth and Climate Sciences (ECS) seminar series. Faculty and senior graduate students rotate to provide background lectures needed to understand the paper/seminar, which will expose students to basic concepts from the wide range of research sub-fields represented within the Earth and Climate Sciences program. Meets twice per week, with one class meeting devoted to each ECS seminar (approximately every second week). Consent of director of graduate studies required.
ECS790 - Special Topics in Earth and Climate Sciences

Subject: ECS
Catalog Number: 790
Title: Special Topics in Earth and Climate Sciences

Description: Content to be determined each semester.

ECS790S - Advanced Topics in Geology

Subject: ECS
Catalog Number: 790S
Title: Advanced Topics in Geology

Description: Topics, instructors, and credits to be arranged each semester.

ECS791 - Independent Study

Subject: ECS
Catalog Number: 791
Title: Independent Study

Description: Consent of instructor required.

ECS792S - Microgrid Seminar

Subject: ECS
Catalog Number: 792S
Title: Microgrid Seminar

Description: This seminar will focus on designing and costing microgrids. Microgrids range from building to campus to community power systems that are connected to the conventional electric grid but can be islanded off from it, to systems that power remote facilities beyond and thus totally disconnected from the grid. Designing a microgrid entails more than simply hooking up distributed generation technologies to one or more loads. It also involves understanding existing regulations and the circumstances under which they can be connected, resolving ownership, etc. This seminar will explore how to analyze both load data and data on local renewable energy resource potential. Prerequisite: Environment 631, 711, and 716L.

ENERGY520 - Resource & Environmental Economics I

Subject: ENERGY
Catalog Number: 520
Title: Resource & Environmental Economics I

Description: Part 1 of a survey course in environmental and natural resource economics. Part 1 focuses on basic theory and methods of economic analysis of environmental problems including benefit-cost analysis, non-market valuation, and instrument choice. Prerequisite: Introductory course in microeconomics and one semester of calculus.

ENERGY520D - Resource & Environmental Economics I
Duke University

ENERGY524 - Water Quality Health

Subject: ENERGY
Catalog Number: 524
Title: Water Quality Health

Description: Explore basic concepts of water quality and human health with focus on the global water cycle, global water demand and availability, chemical properties of water, contaminants in water, health implications, and environmental isotope hydrology. Highlights relationships between human activities, water scarcity, water quality degradation, and ecological and health consequences. Addresses some policy implications related to conflicts over water resources and impact of energy production on water resources. Prerequisites: prior knowledge of introductory calculus and chemistry or consent of instructor.

ENERGY590 - Special Topics in Energy

Subject: ENERGY
Catalog Number: 590
Title: Special Topics in Energy

Description: Content to be determined each semester. May be repeated.

ENERGY590-1 - Special Topics in Energy

Subject: ENERGY
Catalog Number: 590-1
Title: Special Topics in Energy

Description: Topics vary by semester.

ENERGY590S - Advanced Topics in Energy

Subject: ENERGY
Catalog Number: 590S
Title: Advanced Topics in Energy

Description: Selected topics vary by semester.

ENERGY620 - Energy Finance
EN<sub>ER</sub>GY6<sub>30</sub> - Transportation and Energy

**Subject**
ENERGY

**Catalog Number**
630

**Title**
Transportation and Energy

**Description**
Examination of transportation-related energy use and its impact on the environment. Learn how technology, infrastructure, and policy, as well as personal and cultural preferences, interact to meet demands for personal mobility and freight movement. Cutting across these themes will be consideration of strategies to reduce transportation energy use and its environmental impacts, with an introduction to information resources and tools for evaluating both. Provides opportunities to hone problem solving and analytical skills, and challenges students to think critically and creatively about the trade-offs among complex transportation options.

EN<sub>ER</sub>GY6<sub>30</sub>D - Transportation and Energy

**Subject**
ENERGY

**Catalog Number**
630D

**Title**
Transportation and Energy

**Description**
Examination of transportation-related energy use and its impact on the environment. Learn how technology, infrastructure, and policy, as well as personal and cultural preferences, interact to meet demands for personal mobility and freight movement. Cutting across these themes will be consideration of strategies to reduce transportation energy use and its environmental impacts, with an introduction to information resources and tools for evaluating both. Provides opportunities to hone problem solving and analytical skills, and challenges students to think critically and creatively about the trade-offs among complex transportation options.

EN<sub>ER</sub>GY6<sub>31</sub> - Energy Technology and Impact on the Environment

**Subject**
ENERGY

**Catalog Number**
631

**Title**
Energy Technology and Impact on the Environment

**Description**
Efficiencies and environmental impacts of both new and established energy sources and conversion methods. Consideration of alternative energy technologies, including electricity generation by fossil fuels, nuclear, solar, wind and water; space heating and cooling by traditional methods and by solar; and transportation energy in automobiles, mass transit and freight. Environmental consequences of energy choices on local, national and global scales, including toxic emissions, greenhouse gases and resource depletion. Prerequisite: Environment 231 or Environment 711. Instructor consent required.

EN<sub>ER</sub>GY6<sub>31</sub>D - Energy Technology and Impact on the Environment
ENERGY 631D - Energy Technology and Impact on the Environment

**Description**
Efficiencies and environmental impacts of both new and established energy sources and conversion methods. Consideration of alternative energy technologies, including electricity generation by fossil fuels, nuclear, solar, wind and water; space heating and cooling by traditional methods and by solar; and transportation energy in automobiles, mass transit and freight. Environmental consequences of energy choices on local, national and global scales, including toxic emissions, greenhouse gases and resource depletion. Prerequisite: Environment 231 or Environment 711. Instructor consent required.

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ENERGY 635 - Energy Economics and Policy

**Description**
Economics of markets and policies for various energy supply sources, energy demand and efficiency, their interactions with each other, and with the economy and environment. Will explore rationales for why markets for energy and related technologies have been subject to extensive government intervention. Course will analyze effects of policy responses, including energy price regulation, the interface of energy, environmental, and technology policy, and policy motivated by energy security concerns. Prerequisite: Introductory Microeconomics (Economics 101 or equivalent) and college calculus.

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ENERGY 635D - Energy Economics and Policy

**Description**
Economics of markets and policies for various energy supply sources, energy demand and efficiency, their interactions with each other, and with the economy and environment. Will explore rationales for why markets for energy and related technologies have been subject to extensive government intervention. Course will analyze effects of policy responses, including energy price regulation, the interface of energy, environmental, and technology policy, and policy motivated by energy security concerns. Prerequisite: Introductory Microeconomics (Economics 101 or equivalent) and college calculus.

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ENERGY 638 - Environmental Life Cycle Analysis & Decision

**Description**
Provides theoretical foundations of environmental life cycle assessment tools and methods used for products and global supply chains. Introduces various life cycle inventory and life cycle assessment tools used by the community of scientists and industry. Instructor consent required.

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ENERGY 711 - Energy and Environment
Duke University

ENERGY711 - Energy and Environment

Subject: ENERGY
Catalog Number: 711
Title: Energy and Environment

Description:
Overview of the challenges confronting humanity as a consequence of our reliance on energy. Challenges include dwindling supplies, rising demand and environmental degradation. Realistic responses require an understanding of the complexity of the energy system, including energy resources, uses, and impacts, in the context of social, political and economic imperatives. Lectures will be augmented by presentations from guest speakers from industry, government and non-profit organizations.

ENERGY713A - Clean Energy Field Trip

Subject: ENERGY
Catalog Number: 713A
Title: Clean Energy Field Trip

Description:
Field study of the clean energy industry around the San Francisco Bay area, California, with first-hand perspective from renewable energy experts. Includes a field trip with a required fee for the trip.

ENERGY716L - Modeling for Energy Systems

Subject: ENERGY
Catalog Number: 716L
Title: Modeling for Energy Systems

Description:
Introduction to computer programming and operations research in energy systems analysis with emphasis on formulation of optimization problems and simulation models. Applications and case studies dealing with energy systems problems, their externalities, and government policies that affect them. Data analysis, spreadsheet modeling, VBA programming in Excel; linear programming (lp), post-optimality and sensitivity analysis, multi-period lp, stochastic lp, network models for minimum path, maximum flow and optimal planning problems; probabilistic analysis Monte Carlo simulation, including generation of independent and correlated random variables, and goodness of fit tests.

ENERGY727 - Energy Law

Subject: ENERGY
Catalog Number: 727
Title: Energy Law

Description:
The course will examine the legal framework governing energy production and consumption in the United States, and policy approaches for balancing energy needs with other societal goals.

ENERGY790 - Special Topics in Energy

Subject: ENERGY
Catalog Number: 790
Title: Special Topics in Energy

Description:
Topics vary by semester.

ENERGY790-1 - Special Topics in Energy
Energy795 - Connections in Energy: Interdisciplinary Team Projects
Subject
ENERGY
Catalog Number
795
Title
Connections in Energy: Interdisciplinary Team Projects
Description
Teams of undergraduate and graduate students work with faculty supervisors to identify, refine, explore and develop solutions to pressing energy issues. Teams may also include postdoctoral fellows, visiting energy fellows, and other experts from business, government, and the non-profit sector. A team's work may run in parallel with or contribute to an ongoing research project. Teams will participate in seminars, lectures, field work and other learning experiences relevant to the project. Requires substantive paper or product containing significant analysis and interpretation. Instructor consent required.

Energy795-1 - Connections in Energy: Interdisciplinary Team Projects
Subject
ENERGY
Catalog Number
795-1
Title
Connections in Energy: Interdisciplinary Team Projects
Description
Teams of undergraduate and graduate students work with faculty supervisors to identify, refine, explore and develop solutions to pressing energy issues. Teams may also include postdoctoral fellows, visiting energy fellows, and other experts from business, government, and the non-profit sector. A team's work may run in parallel with or contribute to an ongoing research project. Teams will participate in seminars, lectures, field work and other learning experiences relevant to the project. Requires final paper or product containing significant analysis and interpretation. Instructor consent required.

Energy795A - Connections in Energy: Interdisciplinary Team Projects
Subject
ENERGY
Catalog Number
795A
Title
Connections in Energy: Interdisciplinary Team Projects
Description
Teams of undergraduate and graduate students work with faculty supervisors to identify, refine, explore and develop solutions to pressing energy issues. Teams may also include postdoctoral fellows, visiting energy fellows, and other experts from business, government, and the non-profit sector. A team's work may run in parallel with or contribute to an ongoing research project. Teams will participate in seminars, lectures, field work and other learning experiences relevant to the project. Requires substantive paper or product containing significant analysis and interpretation. Instructor consent required. Taught in Beaufort at Duke Marine Lab.

Energy796 - Connections in Energy: Interdisciplinary Team Projects
Teams of undergraduate and graduate students work with faculty supervisors to identify, refine, explore and develop solutions to pressing energy issues. Teams may also include postdoctoral fellows, visiting energy fellows, and other experts from business, government, and the non-profit sector. A team's work may run in parallel with or contribute to an on-going research project. Teams will participate in seminars, lectures, field work and other learning experiences relevant to the project. Requires substantive paper or product containing significant analysis and interpretation. Instructor consent required.

**ENERGY811 - Business and Environment**

Theoretical grounding on Sustainable Systems (SS) thinking and overview of national and international frameworks that have led to development and use of sustainable systems modeling, life cycle analysis and policy decision models. Topics include socio-metabolic consumption, sustainability as a field of inquiry, systems thinking, industrial ecology, earth systems engineering, complexity and resiliency. Explore current drivers and implications of sustainable systems with specific focus on nexus of industry and environmental systems including examining cumulative impacts and benefits resulting from shifting supply chains, green engineering, technological designs and consumer behavior.

**ENERGY811D - Business and Environment**
ENERGY 811D - Business and Environment

Description
Theoretical grounding on Sustainable Systems (SS) thinking and overview of national and international frameworks that have led to development and use of sustainable systems modeling, life cycle analysis and policy decision models. Topics include socio-metabolic consumption, sustainability as a field of inquiry, systems thinking, industrial ecology, earth systems engineering, complexity and resiliency. Explore current drivers and implications of sustainable systems with specific focus on nexus of industry and environmental systems including examining cumulative impacts and benefits resulting from shifting supply chains, green engineering, technological designs and consumer behavior. Instructor consent required.

ENERGY 830 - Building Energy on Campus: Evaluating Efficiency and Conservation Measures at Duke

Description
Buildings use more than 40% of the energy consumed in the US, and are a natural target of energy efficiency and conservation measures. Building owners and facility managers, as well as the policy community, are therefore interested in identifying means of reducing energy consumption in the current building stock and taking advantage of the embodied energy already sunk into its construction. Using the campus as a laboratory, course examines energy use in existing Duke buildings. Students will learn about the relationship between building design and energy use, and gain hands-on experience conducting energy audits and evaluating energy saving measures in campus facilities.

ENERGY 835 - Environmental Law

Description
Examination of rapidly growing body of law concerned with interrelationships between human activities and the larger environment. Focus on rationales for environmental protection; risk assessment and priorities.

ENERGY 891 - Topics in Environmental Regulation

Description
In-depth analysis of current issues in environmental regulation. Topics vary. Course may be repeated.

ENERGY 910 - Environment and Energy Economics
ENVIRON501 - Environmental Toxicology

Subject
ENIRON
Catalog Number
501
Title
Environmental Toxicology

Description
An introduction to the field of environmental toxicology. Study of environmental contaminants from a broad perspective encompassing biochemical, ecological, and toxicological principles and methodologies. Discussion of sources, environmental transport and transformation phenomena, accumulation in biota and ecosystems. Impacts at various levels of organization, particularly biochemical and physiological effects. Taught in Beaufort at Duke Marine Lab. Prerequisite: organic chemistry and an upper-level biology course, or consent of instructor.

ENVIRON501A - Environmental Toxicology

Subject
ENIRON
Catalog Number
501A
Title
Environmental Toxicology

Description
An introduction to the field of environmental toxicology. Study of environmental contaminants from a broad perspective encompassing biochemical, ecological, and toxicological principles and methodologies. Discussion of sources, environmental transport and transformation phenomena, accumulation in biota and ecosystems. Impacts at various levels of organization, particularly biochemical and physiological effects. Taught in Beaufort at Duke Marine Lab. Prerequisite: organic chemistry and an upper-level biology course, or consent of instructor.

ENVIRON501D - Environmental Toxicology

Subject
ENIRON
Catalog Number
501D
Title
Environmental Toxicology

Description
An introduction to the field of environmental toxicology. Study of environmental contaminants from a broad perspective encompassing biochemical, ecological, and toxicological principles and methodologies. Discussion of sources, environmental transport and transformation phenomena, accumulation in biota and ecosystems. Impacts at various levels of organization, particularly biochemical and physiological effects. Prerequisites: organic chemistry and an upper-level biology course, or consent of instructor.

ENVIRON502 - Climate Change and the Law
**ENVIRON502 - Climate Change and the Law**

**Description**
This seminar will examine global climate change and the range of actual and potential responses by legal institutions, in the U.S. and internationally. In so doing it will also explore fundamental questions about legal response to looming crises using climate change as the focal point of a broader discussion. Can legal institutions deal with such mega-problems? Will doing so lead to basic changes in legal institutions?

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**ENVIRON503 - Forest Ecosystems**

**Description**
Emphasis on the processes by which forests circulate, transform, and accumulate energy and materials through interactions of biologic organisms and the forest environment. Ecosystem productivity and cycling of carbon, water, and nutrients provide the basis for lecture and laboratory.

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**ENVIRON504A - Marine Protected Area Monitoring and Management**

**Description**
An interdisciplinary course that addresses concepts, issues, and approaches relevant to marine protected areas (MPAs) and their impacts on marine ecosystems and coastal people. Course will address key topics on MPA design, implementation, management, monitoring, and evaluation. Attention will be given to sensitive marine ecosystems (e.g., coral reefs) and resource-dependent fishing and tourism communities. Using real world case studies, students will apply introduced concepts and quantitative approaches to questions on MPA monitoring and evaluating their impacts. Students will engage with the course material primarily through group discussions, problem sets, and lectures. Taught in Beaufort at Duke Marine Lab.

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**ENVIRON505 - Functional Ecology of Plants**

**Description**
This course is designed for graduate and undergraduate students with interest in plant functional ecology. We explore how (woody) plants function and respond to changing climate. We focus on plant functional traits (e.g., leaf properties, wood density, maximum height) and the main tradeoffs controlling plant form and function in various environments.

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**ENVIRON505D - Functional Ecology of Plants**

**Description**
This course is designed for graduate and undergraduate students with interest in plant functional ecology. We explore how (woody) plants function and respond to changing climate. We focus on plant functional traits (e.g., leaf properties, wood density, maximum height) and the main tradeoffs controlling plant form and function in various environments.
**ENVIRON506 - Environmental Justice: Theory and Practice for Environmental Scientists and Policy Professionals**

**Subject**
ENIRON  

**Catalog Number**
506  

**Title**
Environmental Justice: Theory and Practice for Environmental Scientists and Policy Professionals  

**Description**
Examination of concepts related to theory and practice of environmental justice including: data and analytics used by researchers, decision-makers and other parties; concepts related to meaningful engagement with special attention to American Indian tribes and Indigenous peoples; and broader perspectives on environmental justice related to climate change, cumulative impacts, and other topics. Investigate recent case studies involving food, energy, water, and climate through readings, guest speakers, and classroom discussion. Required field trip.

**ENVIRON507DS - The Amazon: Evolution of Its Climate, Landscape, Ecology, and Human Civilizations**

**Subject**
ENIRON  

**Catalog Number**
507DS  

**Title**
The Amazon: Evolution of Its Climate, Landscape, Ecology, and Human Civilizations  

**Description**
Introduction to the natural and human evolution of the Amazon region of South America, from the Andes Mountains, to the rain forests, to the Amazon River delta. Exploration of the interactions among changes in landscapes, ecology, biota, climate, and human civilizations through time. Topics include human impacts on biodiversity, landscape processes, and resources from pre-history to modern societies, and their future outlook.

**ENVIRON507S - The Amazon: Evolution of Its Climate, Landscape, Ecology, and Human Civilizations**

**Subject**
ENIRON  

**Catalog Number**
507S  

**Title**
The Amazon: Evolution of Its Climate, Landscape, Ecology, and Human Civilizations  

**Description**
Introduction to the natural and human evolution of the Amazon region of South America, from the Andes Mountains, to the rain forests, to the Amazon River delta. Exploration of the interactions among changes in landscapes, ecology, biota, climate, and human civilizations through time. Topics include human impacts on biodiversity, landscape processes, and resources from pre-history to modern societies, and their future outlook.

**ENVIRON512A - Deep-Sea Science and Environmental Management**
**ENVIRON516 - Global Change Biology: From Molecules to Organisms**

**Description**
The course provides students with a foundational understanding of organismal response at the cellular and molecular level to changes in the environment due to climate change and pollution. Increased emissions of greenhouse gases and continuous release of other anthropogenic chemical pollutants are profoundly impacting organismal health. Are some species more vulnerable? What molecular and biochemical toolkits are needed to withstand rapid environmental changes? Discussion will focus on the physiological stress resulting from and the adaptive responses made to changes in temperature, salinity, dissolved oxygen and ocean acidity combined with various chemical stressors in a range of species. Prerequisites in organic chemistry and biology strongly recommended.

**ENVIRON517 - Tropical Ecology**

**Description**
Ecosystem, community, and population ecology of tropical plants and animals with application to conservation and sustainable development. Prerequisite: a course in general ecology.

**ENVIRON517D - Tropical Ecology**

**Description**
Ecosystem, community, and population ecology of tropical plants and animals with application to conservation and sustainable development. Prerequisite: a course in general ecology.

**ENVIRON520 - Resource & Environmental Economics I**

**Description**
Part 1 of a survey course in environmental and natural resource economics. Part 1 focuses on basic theory and methods of economic analysis of environmental problems including benefit-cost analysis, non-market valuation, and instrument choice. Prerequisite: Introductory course in microeconomics and one semester of calculus.
**ENVIRON520D - Resource & Environmental Economics I**

**Subject**
ENVIRON

**Catalog Number**
520D

**Title**
Resource & Environmental Economics I

**Description**
Part 1 of a survey course in environmental and natural resource economics. Part 1 focuses on basic theory and methods of economic analysis of environmental problems including benefit-cost analysis, non-market valuation, and instrument choice. Prerequisite: Introductory course in microeconomics and one semester of calculus. Instructor consent required.

**ENVIRON521 - Resource & Environmental Economics II**

**Subject**
ENVIRON

**Catalog Number**
521

**Title**
Resource & Environmental Economics II

**Description**
Part 2 of a survey course in environmental and natural resource economics. Part 2 focuses on basic theory and methods of economic analysis of natural resource problems including extraction of non-renewable resources over time, fisheries economics and forest economics. Prerequisite: Environment 520.

**ENVIRON521D - Resource & Environmental Economics II**

**Subject**
ENVIRON

**Catalog Number**
521D

**Title**
Resource & Environmental Economics II

**Description**
Part 2 of a survey course in environmental and natural resource economics. Part 2 focuses on basic theory and methods of economic analysis of natural resource problems including extraction of non-renewable resources over time, fisheries economics and forest economics. Prerequisite: Environment 520.

**ENVIRON524 - Water Quality Health**

**Subject**
ENVIRON

**Catalog Number**
524

**Title**
Water Quality Health

**Description**
Explore basic concepts of water quality and human health with focus on the global water cycle, global water demand and availability, chemical properties of water, contaminants in water, health implications, and environmental isotope hydrology. Highlights relationships between human activities, water scarcity, water quality degradation, and ecological and health consequences. Addresses some policy implications related to conflicts over water resources and impact of energy production on water resources. Prerequisites: prior knowledge of introductory calculus and chemistry or consent of instructor.

**ENVIRON528SA - Community-Based Marine Conservation**

**Subject**
ENVIRON

**Catalog Number**
528SA

**Title**
Community-Based Marine Conservation

**Description**
Experiential education course on community-based conservation. Students learn first-hand about the challenges (accomplishments, failures, and promises) involved in its design and practice in developing countries of high biological diversity. Learn about the unique natural and political history, and social characteristics of the places where conservation takes place. Students link local context to broader perspectives through key readings and class discussions. Taught in Beaufort at Duke Marine Lab. Instructor consent required, visit DUML website for details.
ENVIRON530 - Remote Sensing in Coastal Environments

**Subject**: ENVIRon

**Catalog Number**: 530

**Title**: Remote Sensing in Coastal Environments

**Description**
Introduction to the field of remote sensing and image processing with focus on applications to coastal monitoring and currently open research questions. Students will acquire an operational knowledge of various remote-sensing tools and data types, with emphasis on their application in coastal areas. Content will include theory, in-class laboratory exercises, and projects with environmental applications. Prerequisite: introductory or AP physics preferred or permission of instructor.

ENVIRON531L - Economic Valuation of the Environment

**Subject**: ENVIRon

**Catalog Number**: 531L

**Title**: Economic Valuation of the Environment

**Description**
Quantitative course with focus on economic valuation of changes in environmental quality. Covers theoretical foundations of major nonmarket valuation methods and, through a series of problem sets, provides opportunities to develop skills applying those methods. Also covers a range of regression methods commonly employed in valuation studies. Prerequisite: Environment 520 or equivalent and Environment 710 or equivalent.

ENVIRON532 - Evaluation of Public Expenditures

**Subject**: ENVIRon

**Catalog Number**: 532

**Title**: Evaluation of Public Expenditures

**Description**
Basic development of cost benefit analysis from alternative points of view, for example, equity debt, and economy as a whole. Techniques include: construction of cash flows, alternative investment rules, inflation adjustments, optimal timing and duration of projects, private and social pricing. Adjustments for economic distortions, foreign exchange adjustments, risk and income distribution examined in the context of present value rules. Examples and cases from both developed and developing countries.

ENVIRON532D - Evaluation of Public Expenditures

**Subject**: ENVIRon

**Catalog Number**: 532D

**Title**: Evaluation of Public Expenditures

**Description**
Basic development of cost benefit analysis from alternative points of view, for example, equity debt, and economy as a whole. Techniques include: construction of cash flows, alternative investment rules, inflation adjustments, optimal timing and duration of projects, private and social pricing. Adjustments for economic distortions, foreign exchange adjustments, risk and income distribution examined in the context of present value rules. Examples and cases from both developed and developing countries.

ENVIRON533A - Marine Fisheries Policy

**Subject**: ENVIRon

**Catalog Number**: 533A

**Title**: Marine Fisheries Policy

**Description**
Principles, structure, and process of public policy-making for marine fisheries. Topics include local, regional, national, and international approaches to the management of marine fisheries. A social systems approach is used to analyze the biological, ecological, social, and economic aspects of the policy and management process. Taught in Beaufort at Duke Marine Lab.
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<tr>
<th>Subject</th>
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<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>534D</td>
<td>Controlling Zoonotic Diseases Through the One Health Approach</td>
</tr>
</tbody>
</table>

**Description**

This course introduces public health students to entomology, zoonotic diseases, and principals of modern food safety. Students will learn methods for conducting studies of mosquitoes and ticks, controlling zoonotic diseases, and protecting the food supply. A special focus will be upon modern food safety techniques in meat, dairy and produce production. Lectures will be complemented with considerable laboratory or field work.

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<tr>
<th>Subject</th>
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<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>536S</td>
<td>Food, Agriculture and the Environment: Law and Policy</td>
</tr>
</tbody>
</table>

**Description**

The course focuses on (1) the interrelationship of food and agricultural production and environmental sustainability and (2) the influence of a complex array of laws on the development of sustainable, local foods-based markets. Students will explore readings from a variety of sources, hear from guest speakers, and delve into a research project of their own choosing. Students will gain an understanding of how laws govern and interact with food safety research, physical infrastructure, personal consumption habits, patterns of private sector investment, race-based and other structural inequalities, and how the law affects notions of community and reflects underlying cultural values.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>537</td>
<td>Environmental Health and Epidemiology</td>
</tr>
</tbody>
</table>

**Description**

Introduction to environmental effects on human health. Focus on chronic effects of exposure to pollution on key health endpoints, including cancer, neurological health, reproduction and development, cardiovascular and pulmonary health, the interaction between anthropogenic environmental changes and infectious diseases, and the relationship between human health and ecosystem health. Fundamental concepts of epidemiology are introduced in the context of environmental health, methods for statistical analysis of epidemiologic data are presented and contemporary environmental health issues are discussed. Includes discussions and lectures from a variety of experts from the Triangle region.

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<tr>
<td>ENVIRON</td>
<td>538</td>
<td>Global Environmental Health: Economics and Policy</td>
</tr>
</tbody>
</table>

**Description**

Social science perspective on global environmental health. Students will learn to identify primary environmental causes of high burden diseases such as malaria, diarrhea, and respiratory infections; describe how to measure socio-economic impacts of global environmental health diseases; discuss key policies to control global environmental health problems based on private prevention and therapeutic behaviors; and propose frameworks to empirically monitor and evaluate global environmental health policies. A sub-module will focus on climate change and water-borne diseases. Prerequisites: Introductory course in statistics.
ENVIRON539 - Human Health and Ecological Risk Assessment

**Subject**  
ENVIRON

**Catalog Number**  
539

**Title**  
Human Health and Ecological Risk Assessment

**Description**  
Topics central to both health and ecological risk assessment are explored. Basic concepts of hazard identification, dose-response relationships, exposure assessment, and risk characterization and communication are discussed in the context of both human health and environmental assessment. The basis and rationale for using specific, as well as extrapolated, scientific information and expert judgment, and the strengths and weaknesses of alternative approaches, are evaluated. Applications emphasizing real cases are used to illustrate the interdisciplinary process and products of risk assessment, as well as the regulatory use of the information. Group projects emphasized.

ENVIRON540 - Chemical Fate of Organic Compounds

**Subject**  
ENVIRON

**Catalog Number**  
540

**Title**  
Chemical Fate of Organic Compounds

**Description**  
This course will review environmental organic chemistry basics with a focus on contaminant chemistry. We will discuss quantitative processes used in predicting the fate and distribution of organic chemicals in the environment with regards to equilibrium/thermodynamics and some kinetic considerations. Topics include: equilibrium partitioning among air, water, sediments and biological tissues; factors affecting bioaccumulation and biomagnification; processes influencing the ultimate fate of organic contaminants in rivers and lakes; and processes influencing global transport. Prerequisites: University-level general chemistry and organic chemistry within last four years.

ENVIRON540D - Chemical Fate of Organic Compounds

**Subject**  
ENVIRON

**Catalog Number**  
540D

**Title**  
Chemical Fate of Organic Compounds

**Description**  
Equilibrium, kinetic, and analytical approaches applied to quantitative description of processes affecting the distribution and fate of anthropogenic and natural organic compounds in surface and ground waters, including chemical transfers between air, water, soils/sediments, and biota; and thermochemical and photochemical transformations. The relationships between organic compound structure and environmental behavior will be emphasized. Sampling, detection, identification, and quantification of organic compounds in the environment. Prerequisite: university-level general chemistry and organic chemistry within last four years.

ENVIRON542L - Environmental Aquatic Chemistry

**Subject**  
ENVIRON

**Catalog Number**  
542L

**Title**  
Environmental Aquatic Chemistry

**Description**  
Principles of chemical equilibria and kinetics as applied in environmental engineering and science processes. Topics include acid-base equilibrium, the carbonate system, metal complexation, oxidation/reduction reactions, mineral phase solubility and surface sorption. Applied environmental systems include water treatment, soil remediation, air pollution and green engineering. Graduate-level requirements include specific laboratory work and written assignments. Open to graduate students; instructor consent required for undergraduates. Not open to students who have taken CEE 461L.
### ENVIRON543S - Water Cooperation and Conflict

**Subject**
ENVIRON

**Catalog Number**
543S

**Title**
Water Cooperation and Conflict

**Description**
Focuses on potential for transboundary water resources-related conflict and cooperation. Discusses water scarcity concepts, natural resource conflict theory, hydro politics, hydro hegemony, water security, water markets and institutions, game theory, and international water law. Other topics include the economics of water and health. Case studies complement the broader course outlook.

### ENVIRON544S - Collective Action, Property Rights, and the Environment

**Subject**
ENVIRON

**Catalog Number**
544S

**Title**
Collective Action, Property Rights, and the Environment

**Description**
The rational choice tradition (public goods, collective action, game theory, property rights, new institutionalism) as applied to environmental problems, resource exploitation, environmental justice, and the design of an environmentally sound society.

### ENVIRON549 - California Water Crises: A Case Study Approach

**Subject**
ENVIRON

**Catalog Number**
549

**Title**
California Water Crises: A Case Study Approach

**Description**
Reviews history of California’s water dependent economy, leading to a capture, storage system with conveyances extending thousands of miles to deliver water for agriculture, industry and homes. Examines recent political change coupled with chronic issues of a water-rich north, an expanding urban population and a water-poor but politically strong south. Emphasis includes climate change, seismic vulnerability, redirection of river flows, and large scale water reuse. Course will cover specific water crises in other states and nations, providing in depth coverage of aspects of the international crisis in quantity and quality of freshwater.

### ENVIRON550 - Land Use Principles and Policy

**Subject**
ENVIRON

**Catalog Number**
550

**Title**
Land Use Principles and Policy

**Description**
The purpose of the course is to improve your understanding of how land is used, the key factors shaping those uses, the environmental, social and cultural impacts of different land uses, and how land use could be more sustainable. The course covers a wide range of land use issues and topics, from agriculture and forestry to zoning, property rights and natural disasters. Students will examine historical uses, current trends, and likely future uses of land. The main focus of the course will be on land use principles and practices in the United States, but we will also explore examples from other parts of the world.
# Environmental Conservation and Development

**Subject**: ENVIRON  
**Catalog Number**: 551DA  
**Title**: International Conservation and Development  

**Description**
Interrelated issues of conservation and development. Topics include the evolution of the two concepts and of theories regarding the relationship between them, the role of science, values, ethics, politics and other issues in informing beliefs about them, and strategies for resolving conflicts between them. While attention will be given to all scales of interaction (i.e. local, regional, national, international), the focus will be on international issues and the 'north-south' dimensions of the conservation and development dilemma. Examples from marine and coastal environments will be highlighted. Consent of instructor required. Taught in Beaufort at Duke Marine Lab.

# Climate Change and Society

**Subject**: ENVIRON  
**Catalog Number**: 552  
**Title**: Climate and Society  

**Description**
Advanced, interdisciplinary course on causes, consequences, and future trajectory of climate change. Course will cover physical observations of past climate change, role of human activities in driving climate change to date, and impacts of climate change on human and natural systems. Course will analyze how socioeconomic choices affects future climate as well as factors influencing those choices, including risk analyses, geoengineering proposals, intergenerational equity, climate metrics and the media.

**Subject**: ENVIRON  
**Catalog Number**: 552D  
**Title**: Climate and Society  

**Description**
Advanced, interdisciplinary course on causes, consequences, and future trajectory of climate change. Course will cover physical observations of past climate change, role of human activities in driving climate change to date, and impacts of climate change on human and natural systems. Course will analyze how socioeconomic choices affects future climate as well as factors influencing those choices, including risk analyses, geoengineering proposals, intergenerational equity, climate metrics and the media.

# Environmental Conflict Resolution

**Subject**: ENVIRON  
**Catalog Number**: 556  
**Title**: Environmental Conflict Resolution
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<thead>
<tr>
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<td>ENVIRON</td>
<td>556</td>
<td>Environmental Conflict Resolution</td>
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<tr>
<td>ENVIRON</td>
<td>556D</td>
<td>Environmental Conflict Resolution</td>
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<tr>
<td>ENVIRON</td>
<td>557</td>
<td>Social Science Surveys for Environmental Management</td>
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<tr>
<td>ENVIRON</td>
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<td>Social Science Surveys for Environmental Management</td>
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<tr>
<td>ENVIRON</td>
<td>558L</td>
<td>Remote Sensing for Environmental Analysis</td>
</tr>
</tbody>
</table>

**Description**

**ENVIRON556 - Environmental Conflict Resolution**

Practical techniques and scholarly underpinnings of environmental conflict resolution, including interest-based negotiation, mediation, public disputes, science-intensive disputes, and negotiation analysis. In-class time will be spent conducting negotiation role plays of increasing complexity and then debriefing them. Outside of class, students will prepare for the role plays and read background material to aid in debriefing.

**ENVIRON556D - Environmental Conflict Resolution**

Practical techniques and scholarly underpinnings of environmental conflict resolution, including interest-based negotiation, mediation, public disputes, science-intensive disputes, and negotiation analysis. In-class time will be spent conducting negotiation role plays of increasing complexity and then debriefing them. Outside of class, students will prepare for the role plays and read background material to aid in debriefing.

**ENVIRON557 - Social Science Surveys for Environmental Management**

Social science research methods for collecting data for environmental management and policy analysis. Sampling, survey design, focus groups, pretesting, survey implementation, coding, and data analysis. Team projects emphasize development and practice of survey skills. Prerequisite: introductory applied statistics or equivalent.

**ENVIRON557D - Social Science Surveys for Environmental Management**

Social science research methods for collecting data for environmental management and policy analysis. Sampling, survey design, focus groups, pretesting, survey implementation, coding, and data analysis. Team projects emphasize development and practice of survey skills. Prerequisite: introductory applied statistics or equivalent.

**ENVIRON558L - Remote Sensing for Environmental Analysis**

Environmental analysis using satellite remote sensing. Theoretical and technical underpinnings of remote sensing (corrections/pre-processing, image enhancement, analysis) with practical applications (land cover mapping, change detection e.g. deforestation mapping, forest health monitoring). Strong emphasis on hands-on processing and analysis. Will include variety of image types: multispectral, hyper-spectral, radar and others. Recommended prerequisite: familiarity with GIS.
ENVIRON559 - Fundamentals of Geographic Information Systems and Geospatial Analysis

Subject: ENVIRON
Catalog Number: 559
Title: Fundamentals of Geographic Information Systems and Geospatial Analysis

Description:
Fundamental aspects of geographic information systems and satellite remote sensing for environmental applications. Covers concepts of geographic data development, cartography, image processing, and spatial analysis. Gateway into more advanced training in geospatial analysis curriculum. Consent of instructor required.

ENVIRON563 - Cost-Benefit Analysis for Health and Environmental Policy

Subject: ENVIRON
Catalog Number: 563
Title: Cost-Benefit Analysis for Health and Environmental Policy

Description:
Course considers the importance of economic analysis, or cost-benefit analysis (CBA), for public policy assessments. Specific focus is on health and environmental policy, and the steps in identification / cataloguing, quantification, and monetization of impacts of potential policies and projects. Covers: Economic rationale for CBA; Basic principles for assessing the economic effects of projects; Techniques for valuing health and environmental impacts; Intergenerational/philosophical concerns related to CBA; Social discounting; Risk and uncertainty; Comparisons of CBA with other approaches (i.e. cost effectiveness analysis, multi-objective analysis).

ENVIRON564 - Biogeochemistry

Subject: ENVIRON
Catalog Number: 564
Title: Biogeochemistry

Description:
Processes controlling the circulation of carbon and biochemical elements in natural ecosystems and at the global level, with emphasis on soil and surficial processes. Topics include human impact on and social consequences of greenhouse gases, ozone, and heavy metals in the environment. Prerequisite: Chemistry 101DL or equivalent; Recommended: Chemistry 210DL.

ENVIRON564D - Biogeochemistry

Subject: ENVIRON
Catalog Number: 564D
Title: Biogeochemistry

Description:
Discussion version of Biology 564. Processes controlling the circulation of carbon and biochemical elements in natural ecosystems and at the global level, with emphasis on soil and surficial processes. Topics include human impact on and social consequences of greenhouse gases, ozone, and heavy metals in the environment. Recommended prerequisite: Chemistry 101DL and 210DL.

ENVIRON566 - Environmental Analytical Chemistry
ENVIRON566 - Environmental Analytical Chemistry

Subject: ENVIRON
Catalog Number: 566
Title: Environmental Analytical Chemistry

Description: This course covers the fundamentals and applications of analytical chemistry as applied to detection, identification, and quantification of anthropogenic contaminants in environmental samples including air, water, soil, sediment, and biota. The topics include both sample preparation methods (i.e. wet chemistry) and instrumental analysis (e.g. mass spectrometry, chromatography, and optical spectroscopy). Particular emphasis is placed on current advancements in measurement science as applied to environmental chemistry. The material includes both theoretical and practical aspects of environmental analysis. Prerequisite: CHEM 131 or CHEM 151L or consent of instructor.

ENVIRON568S - Integrated Assessment Modeling—Examining Strategies for Meeting Energy and Environmental Goals

Subject: ENVIRON
Catalog Number: 568S
Title: Integrated Assessment Modeling—Examining Strategies for Meeting Energy and Environmental Goals

Description: The primary objective is to provide students with a hands-on opportunity to use one such Integrated Assessment Model—the Global Change Assessment Model with state-level resolution (GCAM-USA)—to examine the air quality and GHG implications of new and emerging energy system technologies. To facilitate the use of GCAM-USA, students will use the GLIMPSE decision support software being developed at EPA. GLIMPSE provides a user interface for GCAM, which facilitates developing and running scenarios as well as visualizing results. Team projects - examinations of electric vehicles, renewable electricity, energy efficiency in buildings and potentially other topics of interest to students.

ENVIRON569 - Should I Eat Fish? Economics, Ecology and Health

Subject: ENVIRON
Catalog Number: 569
Title: Should I Eat Fish? Economics, Ecology and Health

Description: Examines role that individual consumer can play in promoting marine conservation. Course considers array of issues that confront seafood consumers and tradeoffs that only an informed consumer can assess. In context of evaluating seafood students will learn to evaluate tradeoffs systematically, assess how different policy options affect incentives for users and polluters. This process allows students to place consumer initiatives in context of other approaches to marine conservation. Interdisciplinary approach but economic themes will inform course. Course intended for Master of Environmental Management students, but open to advanced undergraduates with permission. This course is intended for MEM students and is based on a Marine Conservation Leadership Certificate capstone course offered previously to undergraduates. Advanced undergraduates permitted pending space availability.

ENVIRON570 - Isotopes in Earth and Environmental Sciences

Subject: ENVIRON
Catalog Number: 570
Title: Isotopes in Earth and Environmental Sciences

Description: The use of stable and radioactive isotopes in earth and environmental sciences, with applications to processes including climate change, hydrology, oceanography, geology and biology. Recommended prerequisite: Introductory college chemistry and calculus.
**ENviron571A - Sojourn in Singapore: Urban Tropical Ecology**

Subject: ENVIRON  
Catalog Number: 571A  
Title: Sojourn in Singapore: Urban Tropical Ecology  


**ENviron572 - Economic Evaluation of Sustainable Development**

Subject: ENVIRON  
Catalog Number: 572  
Title: Economic Evaluation of Sustainable Development  

Description: Examines how one could rationally defend a choice of 'sustainable development' policy. Applies cost-benefit thinking in environment-natural-resources and development contexts. Presents microeconomic concepts emphasizing logic and principles more than mechanics. Intertemporal equity is a focus and equity-efficiency tradeoffs are a theme. Microeconomics prerequisite not required.

**ENviron573 - Coastal and Marine Pollution**

Subject: ENVIRON  
Catalog Number: 573  
Title: Coastal and Marine Pollution  

Description: Sources, fate, and effects of organic, inorganic, and particulate pollutants in the marine environment. Topics include oil spills, coastal eutrophication, marine debris, harmful algae, sewage contamination, dredging, and emerging contaminants. Methods for measuring pollution in the marine environment and consequences for human and ecological health will be discussed. Case studies of impacted marine environments will be highlighted. Short local field trips possible. Recommended prerequisite: introductory chemistry and biology, or consent of instructor.

**ENviron573a - Coastal and Marine Pollution**

Subject: ENVIRON  
Catalog Number: 573A  
Title: Coastal and Marine Pollution  

Description: Sources, fate, and effects of organic, inorganic, and particulate pollutants in the marine environment. Topics include oil spills, coastal eutrophication, marine debris, harmful algae, sewage contamination, dredging, and emerging contaminants. Methods for measuring pollution in the marine environment and consequences for human and ecological health will be discussed. Case studies of impacted marine environments will be highlighted. Short local field trips possible. Taught in Beaufort at Duke Marine Lab. Recommended prerequisite: introductory chemistry and biology, or consent of instructor.

**ENviron575L - Biodiversity Science and Application**
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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tr>
<td>ENviron</td>
<td>575L</td>
<td>Biodiversity Science and Application</td>
</tr>
</tbody>
</table>

**Description**
Processes responsible for natural biodiversity from populations to the globe. Topics include species interactions (e.g., competition, predation, parasitism), natural and human disturbance, climate change, and implications for management and conservation. Lab section involving observation and data from large-scale manipulations, such as experimental hurricanes, fire, and herbivore exclosures.

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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENviron</td>
<td>575S</td>
<td>Biodiversity Science and Application</td>
</tr>
</tbody>
</table>

**Description**
Non-lab version of Biology 565L. Processes responsible for natural biodiversity from populations to the globe. Topics include species interactions (e.g., competition, predation, parasitism), natural and human disturbance, climate change, and implications for management and conservation. Recommended prerequisite: Biology 209D-2 or equivalent.

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENviron</td>
<td>577</td>
<td>Environmental Politics</td>
</tr>
</tbody>
</table>

**Description**
Environmental policy formation and implementation. Topics include interest groups, environmental movements and parties, public opinion, political systems and institutions.

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<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENviron</td>
<td>579S</td>
<td>Collective Action, Environment, and Development</td>
</tr>
</tbody>
</table>

**Description**
Examines the conditions under which collective or participatory decisions may raise welfare in defined ways. Presents the growing empirical evidence for an environment and development setting including common property issues (tragedy of the commons and competing models). Identifies what evidence exists for sharing norms on a background of self-interested strategies. Definitions of and reactions to equity and/or its absence are a focus. Providing scientific information for policy is another. Experimental and behavioral economics are frequently applied.

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<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENviron</td>
<td>581</td>
<td>Global Environmental Health Problems: Principles and Case Studies</td>
</tr>
</tbody>
</table>

**Description**
...
**ENVIRON581D - Global Environmental Health Problems: Principles and Case Studies**

**Subject**
ENVIRON

**Catalog Number**
581D

**Title**
Global Environmental Health Problems: Principles and Case Studies

**Description**
Many environmental problems occur both locally & globally. Having insights and experience from different parts of the world is important for students to gain problem-oriented training. This course will cover fundamental principles on physical & chemical processes related to major environmental problems. These principles will then be integrated to discussions of case studies addressing a specific set of problems. The case studies will involve the participation of invited guest instructors who are experts on specific topics/cases. Depending on preference of guest instructors, they can introduce a case study via online lecturing/chatting or providing a pre-made video. Online course. Instructor consent required.

**ENVIRON581K - Global Environmental Health Problems: Principles and Case Studies**

**Subject**
ENVIRON

**Catalog Number**
581K

**Title**
Global Environmental Health Problems: Principles and Case Studies

**Description**
Many environmental problems occur both locally & globally. Having insights and experience from different parts of the world is important for students to gain problem-oriented training. This course will cover fundamental principles on physical & chemical processes related to major environmental problems. These principles will then be integrated to discussions of case studies addressing a specific set of problems. The case studies will involve the participation of invited guest instructors who are experts on specific topics/cases. Depending on preference of guest instructors, they can introduce a case study via online lecturing/chatting or providing a pre-made video. Online course. Instructor consent required.

**ENVIRON583K - Energy and National Security**
ENVIRON583S - Energy and U.S. National Security

Subject: ENVIRON  
Catalog Number: 583S  
Title: Energy and U.S. National Security

Description
Examines link between reliable, affordable, and sustainable sources of energy and U.S. national security. Includes ethical considerations related to energy resources and wealth distribution, analysis through case study of top foreign oil suppliers to U.S., as well as newer "unconventional" sources of energy such as shale gas and renewables. Extensive use of guest experts from U.S., local and foreign governments as well as industry. Specific skills include thinking like a U.S. diplomat (cross-cultural perspective), writing concise policy memos, and delivering a compelling, succinct oral presentation. Final project will require policy recommendation on an assigned energy security topic.

ENVIRON585 - Fisheries Biogeography and Ecology

Subject: ENVIRON  
Catalog Number: 585  
Title: Fisheries Biogeography and Ecology

Description
Current status of the distribution and abundance of fisheries globally and current topics in fisheries ecology, explored through lecture and discussion of primary literature. Participation in leading discussions and mini literature review. Basic knowledge of ecology and oceanography. Instructor consent required.

ENVIRON585A - Fisheries Biogeography and Ecology

Subject: ENVIRON  
Catalog Number: 585A  
Title: Fisheries Biogeography and Ecology

Description
Current status of the distribution and abundance of fisheries globally and current topics in fisheries ecology, explored through lecture and discussion of primary literature. Participation in leading discussions and mini literature review. Basic knowledge of ecology and oceanography. Intended for master and doctoral students. Taught in Beaufort at Duke Marine Lab.

ENVIRON590 - Special Topics

Subject: ENVIRON  
Catalog Number: 590  
Title: Special Topics

Description
Content to be determined each semester. May be repeated.
# Duke University

## ENVIRON590D - Special Topics

<table>
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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>590D</td>
<td>Special Topics</td>
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</table>

**Description**
Content to be determined each semester. May be repeated.

## ENVIRON590L - Special Topics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
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</thead>
<tbody>
<tr>
<td>ENVIRON</td>
<td>590L</td>
<td>Special Topics</td>
</tr>
</tbody>
</table>

**Description**
Content to be determined each semester. May be repeated.

## ENVIRON592 - UNFCCC Practicum

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>592</td>
<td>UNFCCC Practicum</td>
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</table>

**Description**
The U.N. Climate Change Negotiations Practicum is a Bass Connections-affiliated course that examines the negotiation of international climate change agreements under the United Nations Framework Convention on Climate Change (UNFCCC).

## ENVIRON593 - Independent Studies and Projects

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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>593</td>
<td>Independent Studies and Projects</td>
</tr>
</tbody>
</table>

**Description**
Directed readings or research at the graduate level to meet the needs of individual students. Consent of instructor required. Units to be arranged.

## ENVIRON593K - Independent Studies and Projects

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>593K</td>
<td>Independent Studies and Projects</td>
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</table>

**Description**
For IMEP students or Duke students studying abroad at Duke Kunshan University. Directed readings or research at the graduate level to meet the needs of individual students. Units to be arranged. Instructor consent required.

## ENVIRON600K - Key Areas in International Environmental Policy
<table>
<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>600K</td>
<td>Key Areas in International Environmental Policy</td>
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<tr>
<td>ENVIRON</td>
<td>601K</td>
<td>Building an NGO Toolkit: From Design to Monitoring</td>
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<tr>
<td>ENVIRON</td>
<td>602K</td>
<td>Natural Resources and Protected Area Management</td>
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<tr>
<td>ENVIRON</td>
<td>603</td>
<td>Air Quality: Management</td>
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<tr>
<td>ENVIRON</td>
<td>604</td>
<td>Air Quality: Human Exposure and Health Effects</td>
</tr>
</tbody>
</table>

**ENVIRON601K - Building an NGO Toolkit: From Design to Monitoring**

**Description**

Non-governmental organizations (NGOs) that address conservation issues in China face large, complex, and urgent problems. To be successful, these NGOs must be equipped with the skills to be efficient, effective, and transparent when planning, implementing, and monitoring their conservation initiatives. In this hands-on course, students will become familiar with decision-support tools that allow organizations to systematically address strategic planning, project design, project budgeting, implementation, monitoring, evaluation, communication, and donor transparency. Students will apply these tools to real-world conservation problems. Taught at Duke Kunshan University.

**ENVIRON602K - Natural Resources and Protected Area Management**

**Description**

Toolkit for practical natural resources management and understanding the challenges involved in protected area management. Wildlife monitoring, environmental change tracking, socio-economic surveys and stakeholders engagement. Combines lectures for essential survey methods and experiential education through a seven-day field course. Students will design their own group project to carry out in the local context. Taught in Kunshan, China, at Duke Kunshan University.

**ENVIRON603 - Air Quality: Management**

**Description**

Management systems are discussed, including varied approaches used to address criteria air pollutants, air toxics, mobile sources and acid deposition. Course prepares students to understand systems approach to apply science and technical information to inform policy decisions affecting air quality; understand and be conversant in varied approaches to manage air quality to meet policy objectives; be familiar with major common air pollutants and air quality management approaches applied to each and why approaches vary.
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<tr>
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<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON604</td>
<td>604</td>
<td>Air Quality: Human Exposure and Health</td>
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<tr>
<td>Description</td>
<td></td>
<td>Effects</td>
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<tr>
<td></td>
<td></td>
<td>Looks at how individuals and populations are exposed to air pollution and what adverse health effects the exposure will cause. Covers exposure analysis methods, toxicological and epidemiological studies that examine health effects of air pollution exposure. Students will be prepared to understand concept and major methodologies of analysis for air pollution; how toxicology is used to determine adverse effects of air pollution exposure and underlying biological mechanisms; collect evidence on air pollution health effects in supporting health risk assessment. Prerequisites: general biology, statistics.</td>
</tr>
</tbody>
</table>

| ENVIRON605  | 605            | Air Quality Management: Linking Science to Policy |
| Description |                | Air quality management topics are discussed: the policy foundation and varied approaches used to address criteria air pollutants, air toxics, mobile sources and acid deposition. Management principles are based on science-backed policies. The course covers concepts and methods in atmospheric science, exposure science and health sciences that are used to support policy and management decisions. Relevant science is introduced to understand how air pollutants are generated, how individuals and populations are exposed to air pollution, how air pollution exposure affects health in the general and vulnerable populations and how air pollution and climate change interact in affecting human health. |

| ENVIRON610  | 610            | Ecotoxicology                              |
| Description |                | Overview of ecological and toxicological effects of chemicals on structure and function of ecosystems, primarily at population, community and ecosystem levels of biological organization. Topics include environmental fate and transport of contaminants, biomonitoring, biomarkers/bioindicators, evolution of resistance to pollution, and extrapolating from molecular interactions to ecosystems. Incorporates critical discussion of in-depth case studies to highlight application of ecotoxicological concepts to real-world scenarios. For graduate and advanced undergraduate students. |

| ENVIRON614S | 614S           | Coastal Resilience in the Face of Climate Change |
| Description |                | Recent hurricanes have highlighted the need for coastal communities to address a wide range of issues associated with climate change including increasing resilience when faced with storms and rising sea levels; information-gathering (maps, drones, and scientific research about coastal/ocean processes); law and policy refinements (statutes, regulations, and guidance); and the use of litigation to develop useful common law doctrines relevant to the tidelands and the public trust. Through the use of current cases and policy issues under debate, students will analyze relevant facts, laws, policies, socio-economic considerations, and local ordinances and prepare proposed solutions. |
ENVIRON623L - Ecological Diversity and Climate Change

Subject  | Catalog Number | Title                          
---       | ---------------|--------------------------------
ENVIRON   | 623L            | Ecological Diversity and Climate Change

Description
Evaluates the science of biodiversity and climate change, including changes happening now, in the past, and what we can expect in the future. Topics include forest diebacks, intensifying drought, increased wildfire, insect and pathogen outbreaks, and poleward migrations of land and marine populations. Analytical tools used to quantify change include elements of basic distribution theory, data manipulation in R, and examples of simulation methods. Each lab implements one or more models, including regression, GLMs, and species distribution modeling. Prerequisites: calculus, statistics.

ENVIRON630 - Transportation and Energy

Subject  | Catalog Number | Title                          
---       | ---------------|--------------------------------
ENVIRON   | 630            | Transportation and Energy

Description
Examination of transportation-related energy use and its impact on the environment. Learn how technology, infrastructure, and policy, as well as personal and cultural preferences, interact to meet demands for personal mobility and freight movement. Cutting across these themes will be consideration of strategies to reduce transportation energy use and its environmental impacts, with an introduction to information resources and tools for evaluating both. Provides opportunities to hone problem solving and analytical skills, and challenges students to think critically and creatively about the trade-offs among complex transportation options.

ENVIRON630D - Transportation and Energy

Subject  | Catalog Number | Title                          
---       | ---------------|--------------------------------
ENVIRON   | 630D           | Transportation and Energy

Description
Examination of transportation-related energy use and its impact on the environment. Learn how technology, infrastructure, and policy, as well as personal and cultural preferences, interact to meet demands for personal mobility and freight movement. Cutting across these themes will be consideration of strategies to reduce transportation energy use and its environmental impacts, with an introduction to information resources and tools for evaluating both. Provides opportunities to hone problem solving and analytical skills, and challenges students to think critically and creatively about the trade-offs among complex transportation options.

ENVIRON631 - Energy Technology and Impact on the Environment

Subject  | Catalog Number | Title                          
---       | ---------------|--------------------------------
ENVIRON   | 631            | Energy Technology and Impact on the Environment

Description
Efficiencies and environmental impacts of both new and established energy sources and conversion methods. Consideration of alternative energy technologies, including electricity generation by fossil fuels, nuclear, solar, wind and water; space heating and cooling by traditional methods and by solar; and transportation energy in automobiles, mass transit and freight. Environmental consequences of energy choices on local, national and global scales, including toxic emissions, greenhouse gases and resource depletion. Prerequisite: Environment 231 or Environment 711. Instructor consent required.

ENVIRON631D - Energy Technology and Impact on the Environment
ENVIRON632 - Environmental Education and Interpretation

Subject: ENVIRON  
Catalog Number: 632  
Title: Environmental Education and Interpretation

Description
Course will provide students with foundational knowledge and practical communication skills drawn from five schools of environmental education (EE): natural resource interpretation, science education, European approaches to EE, placed-based learning, and nature connectedness. Through readings, program observations, practicums, and instructor-and peer-based evaluations, students learn to evaluate their audience, develop measurable goals for communication, and refine their presentation skills. Students will also be able to adapt presentations and programs based on the five schools of EE. Students successfully completing course will become NAI Certified Interpretive Guides.

ENVIRON633 - Critical Readings in Environmental Epidemiology

Subject: ENVIRON  
Catalog Number: 633  
Title: Critical Readings in Environmental Epidemiology

Description
Basic introduction to epidemiological methods, skills to understand and critique, and emerging issues in environmental epidemiology reported in relevant journals. Students will gain knowledge of study designs and analytical methods used in applied epidemiology, practice designing translational and environmental epidemiological studies, and understand the role of epidemiology in Risk Assessment. Course will include lectures, readings, class discussion, oral presentation and written assignments.

ENVIRON634 - Introduction to Ecosystem Services and Methods for Quantification

Subject: ENVIRON  
Catalog Number: 634  
Title: Introduction to Ecosystem Services and Methods for Quantification

Description
An introduction to ecosystem services, which is increasingly recognized as a useful concept for decision-making, and provide an overview of the suite of methods that are used to quantify them. The course will also provide an overview of a suite of skills/courses needed for ecosystem services assessment and show how they contribute to quantifying ecosystem services. These skills include Structured Decision Making, Ecological Modeling, Bayesian Belief Networks, Multi-Criteria Decision Analysis, Monetary Valuation (non-market valuation methods), & Structural Equation Modeling. Prerequisites: ecology, microeconomics, Environment 520/521 or equivalent.
ENVIRON635 - Energy Economics and Policy

Subject: ENVIRON  
Catalog Number: 635  
Title: Energy Economics and Policy

Description:
Economics of markets and policies for various energy supply sources, energy demand and efficiency, their interactions with each other, and with the economy and environment. Will explore rationales for why markets for energy and related technologies have been subject to extensive government intervention. Course will analyze effects of policy responses, including energy price regulation, the interface of energy, environmental, and technology policy, and policy motivated by energy security concerns. Prerequisite: Introductory Microeconomics (Economics 101 or equivalent) and college calculus.

ENVIRON635D - Energy Economics and Policy

Subject: ENVIRON  
Catalog Number: 635D  
Title: Energy Economics and Policy

Description:
Economics of markets and policies for various energy supply sources, energy demand and efficiency, their interactions with each other, and with the economy and environment. Will explore rationales for why markets for energy and related technologies have been subject to extensive government intervention. Course will analyze effects of policy responses, including energy price regulation, the interface of energy, environmental, and technology policy, and policy motivated by energy security concerns. Prerequisite: Introductory Microeconomics (Economics 101 or equivalent) and college calculus.

ENVIRON637S - Population and Environmental Dynamics Influencing Health

Subject: ENVIRON  
Catalog Number: 637S  
Title: Population and Environmental Dynamics Influencing Health

Description:
Course examines population, health and environment (PHE) dynamics with focus on interactions in developing or transition economies. Theoretical and empirical approaches governing PHE dynamics from multidisciplinary perspectives, including geography, public health /epidemiology, demography, and economics. Students will obtain experience in design and analysis of PHE studies, and epidemiology of vector-born, chronic and enteric infections.

ENVIRON638 - Environmental Life Cycle Analysis & Decision

Subject: ENVIRON  
Catalog Number: 638  
Title: Environmental Life Cycle Analysis & Decision

Description:
Provides theoretical foundations of environmental life cycle assessment tools and methods used for products and global supply chains. Introduces various life cycle inventory and life cycle assessment tools used by the community of scientists and industry. Instructor consent required.

ENVIRON640 - Climate Change Economics and Policy
<table>
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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENVIRON</td>
<td>640</td>
<td>Climate Change Economics and Policy</td>
</tr>
</tbody>
</table>

**Description**

This course explores the economic characteristics of the climate change problem, assesses national and international policy design and implementation issues, and surveys the economic tools necessary to evaluate climate change policies. Discussion-oriented requiring high degree of student participation. Course objectives are increased comprehension of economic aspects of climate change and ability to apply tools of economic analysis to climate policy and the responses of firms and households to it. Course designed for graduate and advanced undergraduate students.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>640K</td>
<td>Climate Change Economics and Policy</td>
</tr>
</tbody>
</table>

**Description**

Explores the economic characteristics of the climate change problem, assesses national and international policy design and current implementation issues, and surveys the economic tools necessary to evaluate climate change policies. Prerequisite: Public Policy 810 and 812, or equivalent, or consent of the instructor.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>646</td>
<td>Urban Ecology</td>
</tr>
</tbody>
</table>

**Description**

Addresses how to understand urban areas as ecological and socio-ecological systems and the distinction between the study of ecology in and of cities. Examines both through theoretical lens of socio-ecological systems, in which humans and their actions are a component of, rather than disturbance imposed on, ecological systems. Applies theoretical and methodological tools to global, regional, and local urban issues. Prerequisites: One ecology course and one environmental social sciences course.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>646D</td>
<td>Urban Ecology</td>
</tr>
</tbody>
</table>

**Description**

Addresses how to understand urban areas as ecological and socio-ecological systems and the distinction between the study of ecology in and of cities. Examines both through theoretical lens of socio-ecological systems, in which humans and their actions are a component of, rather than disturbance imposed on, ecological systems. Applies theoretical and methodological tools to global, regional, and local urban issues. Prerequisites: One ecology course and one environmental social sciences course.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>658</td>
<td>Applied Qualitative Research Methods</td>
</tr>
</tbody>
</table>

**Description**

Broadly covers qualitative and mixed methods research design, analysis, and interpretation. Students gather a limited amount of their own data and produce a pilot research project throughout the semester. Students learn to use NVivo10, a qualitative research software program.
### ENVIRON658A - Applied Qualitative Research Methods

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>658A</td>
<td>Applied Qualitative Research Methods</td>
</tr>
</tbody>
</table>

**Description**

Broadly covers qualitative and mixed methods research design, analysis, and interpretation. Students gather a limited amount of their own data and produce a pilot research project throughout the semester. Students learn to use NVivo10, a qualitative research software program. Taught in Beaufort at Duke Marine Lab.

### ENVIRON665 - Bayesian Inference for Environmental Models

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<tr>
<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>665</td>
<td>Bayesian Inference for Environmental Models</td>
</tr>
</tbody>
</table>

**Description**

Formulation of environmental models and applications to data using R. Distribution theory, algorithms, and implementation. Topics include physiology, population growth, species interactions, disturbance, and ecosystem dynamics. Discussions focus on classical and current primary literature.

### ENVIRON666 - Aquatic Geochemistry

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>666</td>
<td>Aquatic Geochemistry</td>
</tr>
</tbody>
</table>

**Description**

Geochemistry of the water-solid interface of soils, minerals, and particles in earth systems. Topics will cover the chemical composition of soils, geochemical speciation, mineral weathering and stability, sorption and ion exchange, soil redox processes, and chemical kinetics at environmental surfaces. Prerequisites: CEE 461L or CEE 561L/ENVIRON 542L or permission of instructor.

### ENVIRON667 - Chemical Transformation of Environmental Contaminants

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<th>Subject</th>
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<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>667</td>
<td>Chemical Transformation of Environmental Contaminants</td>
</tr>
</tbody>
</table>

**Description**

Mechanisms and principles underlying organic contaminant transformations in the ambient environment. Topics include hydrolysis, oxidation/reduction, direct and indirect photolysis, and reactions with disinfectant chemicals. Reactions will be considered in context of both natural (e.g. surface water and cloudwater) and engineered (e.g. drinking water, wastewater, and groundwater remediation) systems. Approaches will include both qualitative (reaction mechanism and product identification) as well as quantitative (reaction kinetics and stoichiometry) aspects of environmental reaction chemistry. Prerequisites: CEE 563/ENVIRON 540 or one semester of organic chemistry.

### ENVIRON680 - Economics of Forest Resources
<table>
<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>680D</td>
<td>Economics of Forest Resources</td>
</tr>
</tbody>
</table>

**Description**

Core economic theory of forest management and application of theory to selected forestry policy issues. Course focuses on management of forests for timber production as well as for non-timber values. Concepts explored include policy challenges such as biodiversity conservation, deforestation, community forest management, and payments for ecosystem services. Two groups of economic tools will be used: non-market valuation methods and program evaluation techniques. Prerequisites: college-level calculus, microeconomics and statistics, as well as Excel proficiency.

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<tr>
<td>ENVIRON</td>
<td>680D</td>
<td>Economics of Forest Resources</td>
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</table>

**Description**

Core economic theory of forest management and application of theory to selected forestry policy issues. Course focuses on management of forests for timber production as well as for non-timber values. Concepts explored include policy challenges such as biodiversity conservation, deforestation, community forest management, and payments for ecosystem services. Two groups of economic tools will be used: non-market valuation methods and program evaluation techniques. Prerequisites: college-level calculus, microeconomics and statistics, as well as Excel proficiency.

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<tr>
<td>ENVIRON</td>
<td>701</td>
<td>Forest Measurements</td>
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</table>

**Description**

Course is designed to provide field and analytical measurement skills expected of professionals working in forest ecosystem management. Additional emphasis on habitat assessment, forest vegetation, and wildlife identification. Extensive field work required.

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<th>Subject</th>
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<tr>
<td>ENVIRON</td>
<td>702</td>
<td>Ecology Seminar</td>
</tr>
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</table>

**Description**

Discussion of current research and literature.

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<tr>
<td>ENVIRON</td>
<td>703</td>
<td>Conservation Biology: Theory and Practice</td>
</tr>
</tbody>
</table>

**Description**

An overview of biological diversity, its patterns, and the current extinction crisis. Historical and theoretical foundations of conservation, from human values and law to criteria and frameworks for setting conservation priorities; island biogeography theory, landscape ecology, and socioeconomic considerations in reserve design; management of endangered species in the wild and in captivity; managing protected areas for long term viability of populations; the role of the landscape matrix around protected areas; and techniques for conserving biological diversity in seminatural productive ecosystems like forests. Three field trips. Prerequisite: one ecology course or consent of instructor.
ENviron704LA - Biological Oceanography

Subject  Catalog Number  Title
ENVIRON  704LA  Biological Oceanography

Description
Patterns of abundance, diversity and activity of organisms in major ocean ecosystems. Identifies major physical, chemical and ecological processes that affect these patterns, and analyzes the impact of biology on ecosystems. Uses "flipped" classroom emphasizing hands-on data collection and quantitative analyses, field trips aboard DUML research vessels, and participatory activities to demonstrate core concepts in biological oceanography. Taught in Beaufort at Duke Marine Lab. Spring enrollment requires travel. Graduate section includes experimental design component and research paper on final project.

ENviron705A - Social Impact Analysis

Subject  Catalog Number  Title
ENVIRON  705A  Social Impact Analysis

Description
This course covers the theoretical, methodological and applied aspects of social impact analysis. Students will think sociologically about environmental issues and the social impacts they create. The course reviews key US policies and guidelines that require and inform social impact analysis. Students will understand and critique key methods and approaches used in social impact analysis to generate inclusive decisions that protect the environment and the health of the human communities that share its abundance and meaning. The course will compare and critique a range of national and international social impact examples, including the ethical issues associated with the non-human world. Taught in Beaufort at Duke Marine Lab.

ENviron705L - Ecological Management of Forest Systems (Silviculture)

Subject  Catalog Number  Title
ENVIRON  705L  Ecological Management of Forest Systems (Silviculture)

Description
The aim of the course is to equip future resource managers and environmental consultants with knowledge allowing them to propose lower impact practices to individuals and organizations who need to balance wood production with maintenance of environmental quality. Underlying principles of growth, from seed to mature trees, and stand dynamics are explored. Various alternative methods of manipulating growth, stand structure and development, ranging from little to large perturbations of forest systems, are presented and assessed in terms of their effect on resource quality. Includes laboratory. Instructor consent required.

ENviron706 - Wildlife Surveys

Subject  Catalog Number  Title
ENVIRON  706  Wildlife Surveys

Description
With a focus on birds, reptiles, amphibians, and mammals, this course introduces students to a wide variety of wildlife survey methods and skills through both classroom lectures and hands-on experience in the field. Design, practical application, and post-survey data analyses for conducting wildlife surveys for research as well as for management. Limitations and advantages of various field monitoring techniques; learn to identify many common birds, herps, and mammals of season for this area. Significant time spent in the field.

ENviron708L - Silviculture Prescription
Subject | Catalog Number | Title
--- | --- | ---
ENVIRON | 708L | Silviculture Prescription

Description
Professional foresters meet management objectives through stand manipulation by using appropriate methods. Silviculture prescription is an operational plan that describes the goals, the silvicultural manipulations needed to achieve these goals, and the development of the stands over the projected period. Facing diverse management objectives and stand conditions, success in this planning process depends on understanding the underlying principles of tree growth and stand dynamics, but also relies on the intuitive knowledge that aids in assessing stand conditions and future development. Class is designed to provide the practical experience needed for developing the intuitive knowledge. Instructor consent required.

ENVIRON709 - Conservation Biology and Policy

Subject | Catalog Number | Title
--- | --- | ---
ENVIRON | 709 | Conservation Biology and Policy

Description
Introduction to the key concepts of ecology and policy relevant to conservation issues at the population to ecosystems level. Focus on the origin and maintenance of biodiversity and conservation applications from both the biology and policy perspectives (for example, endangered species, captive breeding, reserve design, habitat fragmentation, ecosystem restoration/rehabilitation). Open to undergraduates only under Biology 270. Recommended prerequisite: introductory biology; also suggested: a policy and/or introductory ecology course.

ENVIRON709A - Conservation Biology and Policy

Subject | Catalog Number | Title
--- | --- | ---
ENVIRON | 709A | Conservation Biology and Policy

Description
Introduction to the key concepts of ecology and policy relevant to conservation issues at the population to ecosystems level. Focus on the origin and maintenance of biodiversity and conservation applications from both the biology and policy perspectives (for example, endangered species, captive breeding, reserve design, habitat fragmentation, ecosystem restoration/rehabilitation). Open to undergraduates only under Biology 270A. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology; suggested: a policy and/or introductory ecology course.

ENVIRON710 - Applied Statistical Modeling for Environmental Management

Subject | Catalog Number | Title
--- | --- | ---
ENVIRON | 710 | Applied Statistical Modeling for Environmental Management

Description
Graphical and exploratory data analysis; modeling, estimation, and hypothesis testing; analysis of variance; random effect models; regression and scatterplot smoothing; generalized linear models; resampling and randomization methods. Concepts and tools involved in data analysis. Special emphasis on examples drawn from the social and environmental sciences. Students to be involved in applied work through statistical computing using software, STATA or R.

ENVIRON711 - Energy and Environment
Energy and Environment

Overview of the challenges confronting humanity as a consequence of our reliance on energy. Challenges include dwindling supplies, rising demand and environmental degradation. Realistic responses require an understanding of the complexity of the energy system, including energy resources, uses, and impacts, in the context of social, political and economic imperatives. Lectures will be augmented by presentations from guest speakers from industry, government and non-profit organizations.

Clean Energy Field Trip

Field study of the clean energy industry around the San Francisco Bay area, California, with first-hand perspective from renewable energy experts. Includes a field trip with a required fee for the trip.

Landscape Ecology

Landscape ecology is concerned with spatial heterogeneity (pattern) on landscapes—what generates pattern, its characteristic scaling in space and time, and why it matters for populations, communities and ecosystem processes. As essentially all agencies that manage land now profess an aim to manage functional, resilient and sustainable landscapes, this course provides the foundational knowledge to support these applications in conservation planning and ecosystem management. The course consists of lectures, small-group exercises and discussions with an emphasis on understanding key concepts and applying these to real-world applications mgmt scenarios. Prerequisite: ecology; statistics preferred.

Modeling for Energy Systems
### ENVIRON716L - Modeling for Energy Systems

**Subject**: ENVIRO

**Catalog Number**: 716L

**Title**: Modeling for Energy Systems

**Description**
Introduction to computer programming and operations research in energy systems analysis with emphasis on formulation of optimization problems and simulation models. Applications and case studies dealing with energy systems problems, their externalities, and government policies that affect them. Data analysis, spreadsheet modeling, VBA programming in Excel; linear programming (lp), post-optimality and sensitivity analysis, multi-period lp, stochastic lp, network models for minimum path, maximum flow and optimal planning problems; probabilistic analysis Monte Carlo simulation, including generation of independent and correlated random variables, and goodness of fit tests.

### ENVIRON717 - Markets for Electric Power

**Subject**: ENVIRO

**Catalog Number**: 717

**Title**: Markets for Electric Power

**Description**
Examines basic concepts and tools in economics and engineering necessary to understand the operation of power markets. Includes physical systems; industry structure and economic models to understand the supply side; operational reliability; long-term reliability; and integration of renewables.

### ENVIRON718K - Environmental Sciences

**Subject**: ENVIRO

**Catalog Number**: 718K

**Title**: Environmental Sciences

**Description**
This course introduces students to the core concepts and topics of environmental sciences. It will give an in-depth overview of main themes in the field of environmental studies: global environmental challenges, human population trends, global atmospheric changes, air, land and water resources and pollution, the ocean and fisheries, key ecosystems (forests, grasslands, wetlands, freshwater and marine environment), biodiversity and conservation, non-renewable and renewable energy, agriculture and sustainable production. Quantitative and qualitative research methods will be introduced with case studies. Taught at Duke Kunshan University.

### ENVIRON719 - Aquaculture
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<th>Subject</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>719</td>
<td>Aquaculture</td>
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<tr>
<td>Description</td>
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<td>The major environmental, social and economic drivers of increasing global aquaculture, with a focus on marine systems. Quantitative evaluation and comparison of the range of species for aquaculture, locations where operations occur, operational aspects including environmental impacts and management considerations. Investigation of alternative approaches and potential future areas for aquaculture expansion as well as social, economic and technical barriers to implementation. Taught in Beaufort at Duke Marine Lab.</td>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>719A</td>
<td>Aquaculture and the Environment</td>
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<tr>
<td>Description</td>
<td></td>
<td>The major environmental, social and economic drivers of increasing global aquaculture, with a focus on marine systems. Quantitative evaluation and comparison of the range of species for aquaculture, locations where operations occur, operational aspects including environmental impacts and management considerations. Investigation of alternative approaches and potential future areas for aquaculture expansion as well as social, economic and technical barriers to implementation. Taught in Beaufort at Duke Marine Lab.</td>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>720S</td>
<td>Land Conservation in Practice</td>
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<tr>
<td>Description</td>
<td></td>
<td>Provides an overview of the applied skills and techniques currently used to conserve land in the land trust movement. Covers a variety of topics from setting priorities for conservation, completing land transactions, working with private landowners, fundraising, land monitoring and stewardship, evaluating conservation success, etc. Course leverages the experience of guest speakers from regional land trust and conservation organizations to provide working examples of how land conservation is done.</td>
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<tr>
<td>ENVIRON</td>
<td>721</td>
<td>Soil Resources</td>
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<tr>
<td>Description</td>
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<td>Emphasis on soil resources as central components of terrestrial ecosystems, as rooting environments for plants, and as porous media for water. Soil physics and chemistry provide the basis for the special problems examined through the course. Laboratory emphasizes field and lab skills, interpretive and analytical.</td>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>722</td>
<td>Hydrologic and Environmental Data Analysis</td>
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<tr>
<td>Description</td>
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<td>Course will focus on acquisition of skills necessary to extract information from observations of hydrological and environmental processes, connect the extracted information with the physical processes generating the data, and estimate physical quantities at ungauged location/times. Emphasis on process understanding via data analysis techniques. Applications used as a way to understand the general concepts, with examples drawn from water science. Prerequisites: Basic computer skills, Algebra, Calculus are required. Experience with computational software (e.g. Matlab or R) is helpful but not required.</td>
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<tr>
<td>ENVIRON</td>
<td>723A</td>
<td>Offshore Renewable Energy &amp; Wildlife Conservation</td>
</tr>
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</table>

### Description

This course will take a holistic approach to evaluating offshore renewable energy development: benefits and challenges of traditional vs. renewable offshore energy including concerns for wildlife, development of environmental impact statements; permitting processes; consultations with industry, government and other stakeholders; and legal implications. Graduate section offered in conjunction with undergraduate course Marsci 323A. Graduate students will write a term-long research paper, conduct literature reviews, develop case studies, and participate in panel discussions. Taught in Beaufort at the Duke Marine Lab.

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<tr>
<td>ENVIRON</td>
<td>724</td>
<td>Landscape Analysis &amp; Management</td>
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</table>

### Description

This course presents a task-oriented perspective on landscape ecology, by introducing the fundamental tasks of landscape analysis and management. These tasks include habitat classification and species distribution modeling; sampling designs for landscapes; inventory and monitoring; site prioritization; change detection and forecasting landscape change; inferences on landscape data (an introduction to the analysis of multivariate and spatial data); and integrated assessment. The course consists of lectures and computer labs. Prerequisites: Environment 714 and Environment 710 or equivalent, or consent of instructor.

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<tbody>
<tr>
<td>ENVIRON</td>
<td>724L</td>
<td>Landscape Analysis &amp; Management</td>
</tr>
</tbody>
</table>

### Description

This course presents a task-oriented perspective on landscape ecology, by introducing the fundamental tasks of landscape analysis and management. These tasks include habitat classification and species distribution modeling; sampling designs for landscapes; inventory and monitoring; site prioritization; change detection and forecasting landscape change; inferences on landscape data (an introduction to the analysis of multivariate and spatial data); and integrated assessment. The course consists of lectures and computer labs. Prerequisites: Environment 714 and Environment 710 or equivalent, or consent of instructor.

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<tr>
<td>ENVIRON</td>
<td>726DA</td>
<td>Evolutionary and Ecological Genetics/Genomics of Marine Mammals</td>
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</table>

### Description

Graduate section of MARSCI 304LA. Graduate section will be offered as seminar and discussion. Students will participate in weekly seminar, literature review and discussion, quizzes, exercises, and will complete a research paper with a focus on how genomic tools can be used for conservation of marine mammals. Offered at the Duke Marine Lab in Beaufort.

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<tr>
<td>ENVIRON</td>
<td>727DS</td>
<td>Forests in the Public Interest Seminar</td>
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</table>
**ENVIRON727S - Forests in the Public Interest Seminar**

**Subject**
ENVIRON

**Catalog Number**
727DS

**Title**
Forests in the Public Interest Seminar

**Description**
Discussion and analysis of current forestry issues of concern to the public—United States and abroad. Students propose discussion topics by identifying forest-related news stories reported in leading print or online sources during the current calendar year. Topics discussed in two parts. Students assess through class discussion the information reported in the news stories and generate questions for additional analysis. Teams then investigate the questions and make an oral presentation of their findings at the next class session; they also provide a list of sources they consulted. Particular themes highlighted in different years. May be taken up to three times for credit. Required for MF degree.

**ENVIRON729A - Oceans in Human and Environmental Health**

**Subject**
ENVIRON

**Catalog Number**
729A

**Title**
Oceans in Human and Environmental Health

**Description**
Focus on the concept of "One Health" that the health of the environment and the people who live in it are linked. The basis (from a biological perspective) of threats facing the marine environment and interactions between environmental and human health and their role in global health disparities. For example, in discussing fisheries and aquaculture, the course will cover environmental impacts of these extractive industries and their importance in human and societal well-being. This course will embrace immersive field experiences in North Carolina that will contextualize classroom learning and develop connections with practitioners and residents. Taught in Beaufort at Duke Marine Lab.

**ENVIRON729DA - Oceans in Human and Environmental Health**

**Subject**
ENVIRON

**Catalog Number**
729DA

**Title**
Oceans in Human and Environmental Health

**Description**
Focus on the concept of "One Health" that the health of the environment and the people who live in it are linked. The basis (from a biological perspective) of threats facing the marine environment and interactions between environmental and human health and their role in global health disparities. For example, in discussing fisheries and aquaculture, the course will cover environmental impacts of these extractive industries and their importance in human and societal well-being. This course will embrace immersive field experiences in North Carolina that will contextualize classroom learning and develop connections with practitioners and residents. Taught in Beaufort at Duke Marine Lab.

**ENVIRON731 - Dendrology**
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<tr>
<td>ENVIRON</td>
<td>731</td>
<td>Dendrology</td>
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<td>This course aims to familiarize students with the secret lives of trees. We begin by learning to identify over 130 woody plants of the Piedmont. To do this, we will also grapple with dichotomous keys and plant systematics to help us identify plants anywhere in the world. We also address topics like the chemical communication of trees, the relationships among wildlife and trees, and the value of trees. Most of this course will be outside. Instructor consent required.</td>
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<tr>
<td>ENVIRON</td>
<td>732</td>
<td>Hydrology in Environmental Management</td>
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<td>An introduction to hydrology by examining how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater with emphasis on hydrological processes inside watersheds. Topic areas include: hydrologic cycle and water balances, evapotranspiration and snow energy balances, vadose zone hydrology, hydrogeology, hyporheic zones, riparian zones, streamflow generation mechanisms, biogeochemical budgets, and field measurement techniques. Linkages between physical hydrology and broader ecological and environmental sciences will be highlighted. Includes local field trips.</td>
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<td>ENVIRON</td>
<td>733</td>
<td>Risk Regulation in the United States, Europe, and Beyond</td>
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<td>Advanced, integrated analysis of the law, science and economics of societies' efforts to assess and manage risks of harm to human health, safety and the environment. Course examines the regulation of a wide array of risks, such as those from medical care and drugs, food, automobiles, drinking water, air pollution, energy, global climate change, and terrorism. The course explores the treatment of several basic issues confronting any regulatory system: risk assessment, risk management (including the debate over &quot;precaution&quot; versus benefit-cost analysis), risk evaluations by experts vs. the public, and risk-risk tradeoffs.</td>
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<td>ENVIRON</td>
<td>734L</td>
<td>Watershed Hydrology</td>
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<td>Introduction to the hydrologic cycle with emphasis on the influence of land use, vegetation, soil types, climate, and land forms on water quantity and quality and methods for control. Development of water balance models. Analysis of precipitation patterns, rainfall and runoff, and nonpoint source impacts. Statistical handling and preparation of hydrologic data, simulation and prediction models, introduction to groundwater flow, laboratory and field sampling methods.</td>
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<tr>
<td>ENVIRON</td>
<td>735</td>
<td>Drones in Marine Biology, Ecology, and Conservation</td>
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Duke University

ENVIRON735A - Drones in Marine Biology, Ecology, and Conservation

Subject: ENVIRON
Catalog Number: 735
Title: Drones in Marine Biology, Ecology, and Conservation

Description
Includes a full overview of past and emerging applications for ecology and biology of marine species and coastal habitats with in-depth discussion on future of drone applications in coastal biological and ecological research. Comprehensive exploration of current drone technologies, including detection of target species, payloads, aeronautical concepts, rules and regulations, mission planning, aircraft design, maintenance, data collection, management and analysis. Components tailored to student interests: Active participation in megafaunal or environmental research and data analysis. Building, operating and maintaining aircraft, programming for manual and autonomous flight.

ENVIRON735A - Drones in Marine Biology, Ecology, and Conservation

Subject: ENVIRON
Catalog Number: 735A
Title: Drones in Marine Biology, Ecology, and Conservation

Description
Lab-based version of Environment 735LA. Taught in Beaufort at Duke Marine Lab.

ENVIRON736K - Planetary Health and Environmental Epidemiology

Subject: ENVIRON
Catalog Number: 736K
Title: Planetary Health and Environmental Epidemiology

Description
Study the human health impacts of accelerating environmental change through interdisciplinary approaches including environmental science, political science, public health and social science; engage in diverse materials from many types of examples of planetary health research, from nutrition and mental health, to infectious and non-communicable diseases. A special emphasis will be placed on environmental epidemiology. Taught in China at Duke Kunshan University. Recommended prerequisite: one quantitative methodology class (statistics, biostatistics, epidemiology, or econometrics).

ENVIRON738 - US Water Governance

Subject: ENVIRON
Catalog Number: 738
Title: US Water Governance

Description
This course examines the governance systems that manage freshwater resources in the United States. American water policy is densely institutionalized, constrained by historical systems of rights and long-established patterns of water usage. It is also organizationally complex, with authority fragmented among myriad agencies and authorities at all jurisdictional levels. Our task will be first to understand current governing structures as a consequence of historical, functional, and political forces, and second to analyze contemporary efforts to promote collaboration, adaptive management, and market solutions within the framework of existing governance systems.

ENVIRON738D - US Water Governance
ENVIRON740 - Water Resources Planning and Management

Subject
ENVIRON
Catalog Number
740
Title
Water Resources Planning and Management

Description
This half-credit course is intended to give students a first exposure to ideas of planning and management of organizations related to water resources. The course will develop a very basic framework for strategic planning for environmental organizations with specific applications to water resources. It will provide some tools for forecasting future water conditions, as well as emerging tools for forecasting uncertain water conditions. Finally, it will expose students to approaches in water management, particularly adaptive management and scenario forecasting.

ENVIRON741 - Water Resources Finance

Subject
ENVIRON
Catalog Number
741
Title
Water Resources Finance

Description
This half-credit course is intended to provide students with applications of project finance to water assets, particularly municipal water/wastewater systems and irrigation infrastructure, financed primarily through municipal bonds. The primary concepts will be forecasting demand, revenue-generation, pricing effects, debt financing, and emerging alternative finance.

ENVIRON744 - Ecology and Conservation of Streams and Rivers

Subject
ENVIRON
Catalog Number
744
Title
Ecology and Conservation of Streams and Rivers

Description
Overview of ecological processes in flowing waters and application to conservation and management of these ecosystems. Lecture and discussion formats to integrate basic principles governing physical, chemical, and biological structure of streams and rivers with anthropogenic drivers of change and policy and management tools. Laboratories will provide hands-on experience in collection and analysis of physical, chemical, and biological data. Field and literature projects will enable students to focus on either basic or applied analysis techniques. Prerequisite: general ecology recommended.
### ENVIRON750 - Genomics of Microbial Diversity

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<tr>
<td>ENVIRON</td>
<td>750</td>
<td>Genomics of Microbial Diversity</td>
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**Description**

Graduate seminar explores the use of genomic approaches to illuminate microbial diversity and to clarify mechanisms generating variation within and among microbial lineages and communities. Course is targeted to Ph.D. students in the areas of genomics, genetics, environmental sciences, ecology, and/or computational biology. Discussions will focus on case studies from the primary literature, followed by computer labs allowing hands-on use of current programs.

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### ENVIRON753LA - Sensory Physiology and Behavior of Marine Animals

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<tr>
<td>ENVIRON</td>
<td>753LA</td>
<td>Sensory Physiology and Behavior of Marine Animals</td>
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**Description**

Sensory physiological principles with emphasis on visual and chemical cues. Laboratories will use behavior to measure physiological processes. Only open to undergraduates under Biology 373LA. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology and chemistry.

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### ENVIRON754A - Research Design for Environmental Social Sciences

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<tr>
<td>ENVIRON</td>
<td>754A</td>
<td>Research Design for Environmental Social Sciences</td>
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</table>

**Description**

Examination of the concept of research (philosophy, epistemology, practice) along with methods used widely in the social sciences. Focus is on qualitative methods, and related research ethics, objectives, design, data collection, analysis, and presentation. Consideration of the relevance and utility of qualitative research methods for understanding human uses, values, interactions, and beliefs about the environment. Taught in Beaufort at Duke Marine Lab. Online course.

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### ENVIRON755 - Community-Based Environmental Management
ENVIRON755D - Community-Based Environmental Management

**Subject**
ENVIRON

**Catalog Number**
755D

**Title**
Community-Based Environmental Management

**Description**
Goal of the course is to provide students with fundamental theory and methods that will allow them to identify some of the potential problems and pitfalls associated with community-based environmental management (CBEM) initiatives, both domestically and internationally, along with tools necessary to create and manage their own projects. To accomplish this, course will combine readings and discussion of academic literature with presentations of specific CBEM case studies, guest speakers, and interactions with local CBEM projects.

ENVIRON756 - Spatio-Temporal Environmental Models

**Subject**
ENVIRON

**Catalog Number**
756

**Title**
Spatio-Temporal Environmental Models

**Description**
Spatio-temporal models are now being widely used for inference on environmental data. This course will consist of weekly topics with readings of new literature and application of models and software to data sets. We will specifically focus on spBayes in R. Students will each volunteer to lead one week, track down and distribute a data set, set up a model and provide a short demo on computation.

ENVIRON756A - Spatio-Temporal Environmental Models

**Subject**
ENVIRON

**Catalog Number**
756A

**Title**
Spatio-Temporal Environmental Models

**Description**
Spatio-temporal models are now being widely used for inference on environmental data. This course will consist of weekly topics with readings of new literature and application of models and software to data sets. We will specifically focus on spBayes in R. Students will each volunteer to lead one week, track down and distribute a data set, set up a model and provide a short demo on computation.

Taught in Beaufort at Duke Marine Lab. Online course.

ENVIRON759K - Environmental GIS
### ENVIRON759K - Environmental GIS

**Subject** | **Catalog Number** | **Title**  
---|---|---  
ENVIRON | 759K | Environmental GIS  

**Description**
Core concepts and latest application of geographic information system in environment area; an in-depth overview of the key data types (raster and vector files) in this area, data collection and entry, data management, data analysis and output using ArcGIS; introduction of application of GIS in real world problem solving, such as species habitat mapping and conservation planning. Students will be exposed to Google Earth, QGIS and other open source GIS tools. Taught in China at Duke Kunshan University.

### ENVIRON760A - Western Field Trip

**Subject** | **Catalog Number** | **Title**  
---|---|---  
ENVIRON | 760A | Western Field Trip  

**Description**
One-week trip to observe land management and utilization practices in the western United States. Exposure to ecological, economic, and policy issues, as well as watershed, wildlife, and land use questions. May be repeated for credit. Consent of instructor required.

### ENVIRON761 - Geospatial Analysis for Land and Water Management

**Subject** | **Catalog Number** | **Title**  
---|---|---  
ENVIRON | 761 | Geospatial Analysis for Land and Water Management  

**Description**
Application course focusing on spatial analysis and image processing applications to support conservation management. Habitat mapping, spatial analysis of animal movements, habitat modeling, and the optimization of nature reserve selection. Requires a fundamental knowledge of geospatial analysis theory and analysis tools. Consent of instructor required. Prerequisite: Environment 559.

### ENVIRON762 - Environmental Mega-Trends

**Subject** | **Catalog Number** | **Title**  
---|---|---  
ENVIRON | 762 | Environmental Mega-Trends  

**Description**
Course investigates major, over-arching trends in environmental science, policy, thought, and practice and likely trajectories for the coming 25 years. Goal is to understand these trends and assess how changes in the environment might impact- and be impacted by- society, from the scale of individual decisions to global economies. Individual topics driven by emerging issues that are of most pressing interest but also that may not have immediately obvious connections to contemporary environmental discussions.

### ENVIRON763 - Forest Management Traveling Seminar

**Subject** | **Catalog Number** | **Title**  
---|---|---  
ENVIRON | 763 | Forest Management Traveling Seminar  

**Description**
Covers current topics in the broad field of forest management. Taught as a set of coordinated field trips with expert contacts in sites in the Carolina piedmont, coastal plain, and mountains. Topics of past seminars include fiber utilization, best management practices, forest regeneration, the chip mill issue, forest-pest management, and forest preservation management. May be repeated for credit.
**ENVIRON764 - Applied Differential Equations in Environmental Sciences**

**Subject**: ENVIRON  
**Catalog Number**: 764  
**Title**: Applied Differential Equations in Environmental Sciences  

**Description**
General calculus and analytic geometry review; numerical differentiation and integration; analytic and exact methods for first and second order ordinary differential equations (ODE); introduction to higher order linear ODE, numerical integration of ODEs and systems of ODEs; extension of Euler’s method to partial differential equations (PDE) with special emphasis on parabolic PDE. Example applications include population forecasting, soil-plant-atmosphere water flow models, ground water and heat flow in soils, and diffusion of gases from leaves into the atmosphere. Prerequisite: Mathematics 21 or equivalent or consent of instructor.

---

**ENVIRON765 - Geospatial Analysis for Coastal and Marine Management**

**Subject**: ENVIRON  
**Catalog Number**: 765  
**Title**: Geospatial Analysis for Coastal and Marine Management  

**Description**
Application course focusing on spatial analysis and image processing applications to support coastal and marine management. Covers benthic habitat mapping, spatial analysis of marine animal movements, habitat modeling, optimization of marine protected areas. Requires fundamental knowledge of geospatial analysis theory and analysis tools. Consent of instructor required. Prerequisite: Environment 559.

---

**ENVIRON766A - Ecology of Southern Appalachian Forests**

**Subject**: ENVIRON  
**Catalog Number**: 766A  
**Title**: Ecology of Southern Appalachian Forests  

**Description**
Field trips to various forest ecosystems in the southern Appalachian Mountains. Species identification, major forest types, field sampling, and history of effects of human activities.

---

**ENVIRON766DA - Ecology of Southern Appalachian Forests**

**Subject**: ENVIRON  
**Catalog Number**: 766DA  
**Title**: Ecology of Southern Appalachian Forests  

**Description**
Field trips to various forest ecosystems in the southern Appalachian Mountains. Species identification, major forest types, field sampling, and history of effects of human activities.

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**ENVIRON767 - Entrepreneurial Experience**
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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENVIRON</td>
<td>767D</td>
<td>Entrepreneurial Experience</td>
</tr>
</tbody>
</table>

**Description**: Teaches marketing, finance and business planning within the context of forming a start-up. Core concepts include: establishing a value proposition; identifying an opportunity; intellectual property and technology management; marketing & financing a start-up; and exiting a company. The course has a technology focus, but many of the concepts apply to any start-up activity. Students will form teams to go through all the steps required to form a business, stopping short of executing legal agreements to do so. The experience is an ideal springboard for students who want to start a company or be part of an early-stage company in the future.

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<th>Subject</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>770A</td>
<td>Physical Oceanography</td>
</tr>
</tbody>
</table>

**Description**: Fundamental physical principles of ocean circulation. Physical properties of seawater; forces acting on the ocean such as heat, pressure gradients, wind stress, rotation, and friction; and conservation equations for heat, mass and momentum. Applications include geostrophic balances, thermal wind, coastally trapped waves, El Nino/ENSO, and tidal circulation. Taught in Beaufort at Duke Marine Lab. Prerequisite: prior course work in calculus and physics or permission of instructor.

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<th>Subject</th>
<th>Catalog Number</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>771L</td>
<td>GIS Field Skills</td>
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</tbody>
</table>

**Description**: Covers integration of GPS and GIS technology for field data collection. Data is set up in ArcGIS in lab, exported to GPS units, field data to be collected, and imported back to GIS system. ArcGIS Personal Geodatabase is the fundamental data structure. Course covers data accuracy and precision and how to use base stations to correct data differentially for highest possible accuracy. Will discuss how to determine what GPS unit is necessary for project accuracy needs. Prerequisite: Environment 559.

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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>773A</td>
<td>Marine Ecology</td>
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</table>

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### ENVIRON773L - Marine Ecology

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<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENVIRON</td>
<td>773L</td>
<td>Marine Ecology</td>
</tr>
</tbody>
</table>

**Description**
Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, lab exercises and an independent project. Lecture topics include physical characteristics of marine systems, adaptation to environment, species interactions, biogeography, larval recruitment, and biodiversity and conservation of communities found in rocky shores, tidal flats, beaches, marshes, mangrove, coral reefs, and subtidal areas. Not open to students who have taken Biology 273LA. Taught in Beaufort at Duke Marine Lab. Grad students submit literature review. Prerequisite: introductory biology.

### ENVIRON773LA - Marine Ecology

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<thead>
<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ENVIRON</td>
<td>773LA</td>
<td>Marine Ecology</td>
</tr>
</tbody>
</table>

**Description**
Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, lab exercises and an independent project. Lecture topics include physical characteristics of marine systems, adaptation to environment, species interactions, biogeography, larval recruitment, and biodiversity and conservation of communities found in rocky shores, tidal flats, beaches, marshes, mangrove, coral reefs, and subtidal areas. Not open to students who have taken Biology 273LA. Taught in Beaufort at Duke Marine Lab. Grad students submit literature review. Prerequisite: introductory biology.

### ENVIRON774 - One Health: From Philosophy to Practice

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>774</td>
<td>One Health: From Philosophy to Practice</td>
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</tbody>
</table>

**Description**
Interdisciplinary course introducing construct of One Health as increasingly important to a holistic understanding of prevention of disease and maintenance of health. Includes discussion of bidirectional impact of animal health on human health, impact of earth's changing ecology on health. Learning objectives include 1) to describe how different disciplines contribute to the practice of One Health, 2) to creatively design interdisciplinary interventions to improve Global Health using a One Health model. Course will include weekly 2-hour multi-campus seminar off-site at NC Biotechnology Center with on-campus discussion section using case studies to supplement the seminar.

### ENVIRON775 - Ocean and Coastal Law and Policy
ENVIRON776 - Marine Mammals

Subject  | Catalog Number | Title
----- | -------- | -----
ENVIRON   | 776      | Marine Mammals

Description
Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). The biology of cetaceans, pinnipeds, sirenians, and sea otters. Detailed consideration given to the adaptations that allow these mammals to live in the sea. Evaluation of the scientific, ethical, and aesthetic factors influencing societal attitudes toward these animals and of their conservation management in light of domestic legislation and international treaties.

ENVIRON776A - Marine Mammals

Subject  | Catalog Number | Title
----- | -------- | -----
ENVIRON   | 776A     | Marine Mammals

Description
Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). Only open to undergraduates under Biology 376A. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology.

ENVIRON776L - Marine Mammals

Subject  | Catalog Number | Title
----- | -------- | -----
ENVIRON   | 776L     | Marine Mammals

Description
Laboratory version of Environment 776. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. Recommended prerequisite: introductory biology.

ENVIRON776LA - Marine Mammals

Subject  | Catalog Number | Title
----- | -------- | -----
ENVIRON   | 776LA    | Marine Mammals

Description
Laboratory version of Environment 776LA. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology.

ENVIRON777A - Biology and Conservation of Sea Turtles
ENVIRON777L - Biology and Conservation of Sea Turtles

Subject: ENVIRON
Catalog Number: 777L
Title: Biology and Conservation of Sea Turtles

Description: Biology including the anatomy, physiology, behavior, life histories, and population dynamics of sea turtles linked to conservation issues and management. Focus on threatened and endangered sea turtle species, with special attention to science and policy issues in United States waters. Includes field experience with the animals and with their habitat requirements. Sea turtle assessment and recovery efforts, fishery-turtle interactions, population modeling and state/national/international management efforts. Only to undergraduates as Biology 375L. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology.

ENVIRON777LA - Biology and Conservation of Sea Turtles

Subject: ENVIRON
Catalog Number: 777LA
Title: Biology and Conservation of Sea Turtles

Description: Biology including the anatomy, physiology, behavior, life histories, and population dynamics of sea turtles linked to conservation issues and management. Focus on threatened and endangered sea turtle species, with special attention to science and policy issues in United States waters. Includes field experience with the animals and with their habitat requirements. Sea turtle assessment and recovery efforts, fishery-turtle interactions, population modeling and state/national/international management efforts. Only open to undergraduates under Biology 375LA. Taught in Beaufort at Duke Marine Lab. Prerequisite: introductory biology.

ENVIRON778L - Comparative Physiology of Marine Animals

Subject: ENVIRON
Catalog Number: 778L
Title: Comparative Physiology of Marine Animals

Description: Physiology of marine animals with emphasis on comparisons between marine vertebrates and humans. Focus on physiological processes including gas exchange, circulation, osmoregulation, metabolism, thermoregulation, endocrine, neural control and sensory systems. Lectures and laboratories illustrate the methodology, analysis techniques, and written reporting of physiological research. Open to undergraduates as Biology or Environment 278L.
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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>778LA</td>
<td>Comparative Physiology of Marine Animals</td>
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<tr>
<td>Description</td>
<td></td>
<td>Physiology of marine animals with emphasis on comparisons between marine vertebrates and humans. Focus on physiological processes including gas exchange, circulation, osmoregulation, metabolism, thermoregulation, endocrine, neural control and sensory systems. Lectures and laboratories illustrate the methodology, analysis techniques, and written reporting of physiological research. Open to undergraduates only under Biology or Environment 278LA. Four units (fall, spring); six units (summer). Taught in Beaufort at Duke Marine Lab.</td>
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<td>ENVIRON780 - Environmental Exposure Analysis</td>
<td>780</td>
<td>Environmental Exposure Analysis</td>
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<tr>
<td>Description</td>
<td>Environmental Exposure Analysis</td>
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<tr>
<td>ENVIRON781K - Narrating Nature: Documentaries For Environmental Studies</td>
<td>781K</td>
<td>Narrating Nature: Documentaries For Environmental Studies</td>
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<tr>
<td>Description</td>
<td>Narrating Nature: Documentaries For Environmental Studies</td>
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<tr>
<td>ENVIRON782 - Marketing for Environmental Professionals</td>
<td>782</td>
<td>Marketing for Environmental Professionals</td>
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<td>Description</td>
<td>Marketing for Environmental Professionals</td>
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<tr>
<td>ENVIRON782D - Marketing for Environmental Professionals</td>
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Duke University
### ENVIRON782D - Marketing for Environmental Professionals

**Subject**
ENVIRON  

**Catalog Number**
782D  

**Title**
Marketing for Environmental Professionals  

**Description**
Focus of course is foundations of entrepreneurial activity within the context of environmental sciences and policy. Course concentrates on new enterprises based on substantial technology innovations with potential for high growth and funding by venture capitalists. Format is readings, lectures and case discussion with practical exposure to all basic operational tools required to start up and operate a company.

### ENVIRON784LA - Sound in the Sea: Introduction to Marine Bioacoustics

**Subject**
ENVIRON  

**Catalog Number**
784LA  

**Title**
Sound in the Sea: Introduction to Marine Bioacoustics  

**Description**
Fundamentals marine bioacoustics with focus on current literature and conservation issues. Topics include: intro acoustics; acoustic analysis methods and quantitative tools; production/recording of sound; ocean noise; propagation theory; active/passive acoustics; hearing, sound production and communication in marine organisms, potential impacts of anthropogenic noise; and regulation of marine sound. Lab focus on methodologies for generating, recording and analyzing marine sounds. Grad students responsible for additional acoustic analyses and results prep for student projects plus preparation additional lit review/critique. Taught in Beaufort at Duke Marine Lab. Prerequisite: AP or introductory biology or consent; Physics 41L or 161L (or equivalent) or consent.

### ENVIRON785A - Conservation Biology & Service Learning: Coastal ecosystems, restoration and communities

**Subject**
ENVIRON  

**Catalog Number**
785A  

**Title**
Conservation Biology & Service Learning: Coastal ecosystems, restoration and communities  

**Description**
Marine conservation emphasizing community outreach at local schools focusing on issues in marine conservation and how they are addressed. Lectures cover principles of conservation, biodiversity, extinction risks, genetic tools, fishery by-catch, over-exploitation, habitat degradation, invasive species, climate change, marine protected areas. Students will develop and teach activities that address conservation topics for local school students. Graduate students will undertake an additional project evaluation component which will include the development of an evaluation rubric, conducting an evaluation, and assessing the results of the evaluation. Taught in Beaufort at the Duke Marine Lab.

### ENVIRON786 - Marine Policy

**Subject**
ENVIRON  

**Catalog Number**
786  

**Title**
Marine Policy  

**Description**
Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics.

### ENVIRON786A - Marine Policy (A)
### ENVIRON786A - Marine Policy (A)

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<th>Subject</th>
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<tr>
<td>ENVIRON</td>
<td>786A</td>
<td>Marine Policy (A)</td>
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</tbody>
</table>

**Description**

Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics. Consent of instructor required. Taught in Beaufort at Duke Marine Lab.

### ENVIRON787A - Analysis of Ocean Ecosystems

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<th>Subject</th>
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<tr>
<td>ENVIRON</td>
<td>787A</td>
<td>Analysis of Ocean Ecosystems</td>
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</tbody>
</table>

**Description**

The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum’s ecosystem concept; structure and function of the earth’s major ecosystems. Open to undergraduates only under Biology 272A. Taught in Beaufort at Duke Marine Lab. Prerequisite: one year of biology, one year of chemistry, or consent of instructor.

### ENVIRON788LA - Biodiversity of Marine Invertebrates

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>788LA</td>
<td>Biodiversity of Marine Invertebrates</td>
</tr>
</tbody>
</table>

**Description**

An introduction to the biodiversity represented by major marine invertebrate groups, with emphasis on the diversity of body forms and behaviors and on anatomical structures and functions. Field trips primarily by boat allow students to explore invertebrates characteristic of a variety of coastal habitats in North Carolina, including mud flats, sandy beaches, salt marshes, oyster reefs, piers and docks, and the water column. Live invertebrates maintained in the laboratory serve as models for detailed study of form and function. Taught in Beaufort at Duke Marine Lab.

### ENVIRON790 - Special Topics

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>790</td>
<td>Special Topics</td>
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</tbody>
</table>

**Description**

Content to be determined each semester. May be repeated.

### ENVIRON790A - Duke-Administered Study Away: Special Topics

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tr>
<td>ENVIRON</td>
<td>790A</td>
<td>Duke-Administered Study Away: Special Topics</td>
</tr>
</tbody>
</table>

**Description**

Content to be determined each session.
**Subject** | **Catalog Number** | **Title**  
--- | --- | ---  
ENVIRON | 790D | Special Topics  
Description  
Content to be determined each semester. May be repeated.

**ENVIRON790L - Special Topics**  
Subject | Catalog Number | Title  
--- | --- | ---  
ENVIRON | 790L | Special Topics  
Description  
Content to be determined each semester. May be repeated.

**ENVIRON790LA - Duke-Administered Study Away: Special Topics**  
Subject | Catalog Number | Title  
--- | --- | ---  
ENVIRON | 790LA | Duke-Administered Study Away: Special Topics  
Description  
Content to be determined each session.

**ENVIRON790SA - Duke-Administered Study Away: Special Topics**  
Subject | Catalog Number | Title  
--- | --- | ---  
ENVIRON | 790SA | Duke-Administered Study Away: Special Topics  
Description  
Content to be determined each session.

**ENVIRON791 - Independent Studies and Projects**  
Subject | Catalog Number | Title  
--- | --- | ---  
ENVIRON | 791 | Independent Studies and Projects  
Description  
Directed readings or research at the graduate level to meet the needs of individual students. Consent of instructor required. Units to be arranged.

**ENVIRON792 - Wetlands of Coastal North Carolina**  
Subject | Catalog Number | Title  
--- | --- | ---  
ENVIRON | 792 | Wetlands of Coastal North Carolina  
Description  
This field based course explores the ecology and management of coastal wetlands North Carolina. Wetlands included in the course include Pocosin bogs, bottomland hardwoods, cedar swamps, freshwater marshes and coastal saltmarshes. Field measurements are taken for water quality, soils and vegetation. Analysis includes the effects of sea level as well as urban coastal development, farming and forestry rise on coastal wetland communities. Students are required to be enrolled in or have taken a wetland or aquatic ecology course. Instructor consent required.
### ENVIRON795 - Community-Based Environmental Management Practicum

**Subject**: ENVIRON  
**Catalog Number**: 795  
**Title**: Community-Based Environmental Management Practicum

**Description**
Course is designed for students who wish to learn theory, skills and tools necessary for working with communities to manage their own environment. Course includes in-class lectures, discussions of readings, guest speakers and a client-driven service-learning project with a community-based organization in North Carolina. Topics will include: community organizing; assessing and capturing resources; participatory planning and evaluation; participatory monitoring; outreach and social marketing; and political action for environmental change. Second of two required courses for the Community-Based Environmental Management certificate (NSOE only). Prerequisite: Environment 755.

### ENVIRON796 - Financial Foundations for Environmental Managers

**Subject**: ENVIRON  
**Catalog Number**: 796  
**Title**: Financial Foundations for Environmental Managers

**Description**
An introductory finance course covering a broad range of topics with the goal of creating a financial conversation relevant to environmental management, financial comprehension and fluency. Closely related to the field of economics, finance entails the study and practice of asset pricing, money flows and the financial markets. From an applied perspective, it provides the means to understand pricing and the valuation of future cash flows, and comprises a critical underpinning of both professional and personal management. Financial decision-making fields of practice e.g. accounting, budgeting, and investing are cornerstones of modern society and have tremendous environmental implications.

### ENVIRON803K - Environmental Policy Process

**Subject**: ENVIRON  
**Catalog Number**: 803K  
**Title**: Environmental Policy Process

**Description**
This course provides an introduction to and overview of the environmental policy process. The first part of the course introduces the environmental policy process with case studies from different countries exemplifying regional differences. The second part of the course introduces various aspects and challenges in the design and formation of environmental policies. The third part of the course focuses on implementation and tools to evaluate the impact of environmental policies. The fourth part of the course discusses the formation of international environmental policies and their impact on national priorities. Taught at Duke Kunshan University.

### ENVIRON805K - Environmental Economics

**Subject**: ENVIRON  
**Catalog Number**: 805K  
**Title**: Environmental Economics

**Description**
An overview of environmental economics by introducing analytical methods and tools to analyze environmental problems and identify policy solutions; including 1) a microeconomic foundation of environmental economics, with a focus on market efficiency and market failures; 2) environmental policy decision tools, such as benefit-cost analysis and cost-effectiveness criterion; 3) environmental regulation, with topics covering command-and-control regulation, market-based approaches, and behavioral interventions.
ENVIRON806 - Duke Forest Practicum

Description
Designed to focus on practical skills required of land managers in a variety of settings, including conservation organizations, government, and industrial and non-industrial forestland ownerships. The management plan of the Duke Forest will serve as a guide and example for specific resource and administrative considerations. Classroom and field settings provide hands-on experience with range of topics, including elements of a forest management plan, certification and best management practices, timber sales planning and administration, conservation easements, wildlife management, and recreation management. Open only to MEM and MF students. Instructor consent required.

ENVIRON806K - Environmental Economics II

Description
This course provides for continued development and practice of skills learned in Statistics and Program Evaluation and Environmental Economics. Students develop conceptual and professional skills related to environmental policy evaluation. The goal is to stimulate critical thinking about today’s environmental problems and the public policies designed to improve them by implementing the theories and principles acquired in class. Prerequisites: Public Policy 870K and Environment 805K or instructor consent. Taught at Duke Kunshan University.

ENVIRON808 - Aquatic and Wetland Field Skills

Description
Introduces students to basic techniques of data collection and application of field indicators in wetlands. In the course students will monitor wetland hydrology, soils and plant communities for research purposes and for jurisdictional determination of wetland boundaries using U.S. Army Corps of Engineers protocols.

ENVIRON808L - Aquatic and Wetland Field Skills

Description
Introduces students to basic techniques of data collection and application of field indicators in wetlands. In the course students will monitor wetland hydrology, soils and plant communities for research purposes and for jurisdictional determination of wetland boundaries using U.S. Army Corps of Engineers protocols.

ENVIRON809 - Wetland Restoration Ecology
Duke University

ENVIRON811 - Business and Environment

Subject ENVRON
Catalog Number 811
Title Business and Environment

Description
Theoretical grounding on Sustainable Systems (SS) thinking and overview of national and international frameworks that have led to development and use of sustainable systems modeling, life cycle analysis and policy decision models. Topics include socio-metabolic consumption, sustainability as a field of inquiry, systems thinking, industrial ecology, earth systems engineering, complexity and resiliency. Explore current drivers and implications of sustainable systems with specific focus on nexus of industry and environmental systems including examining cumulative impacts and benefits resulting from shifting supply chains, green engineering, technological designs and consumer behavior.

ENVIRON811D - Business and Environment

Subject ENVRON
Catalog Number 811D
Title Business and Environment

Description
Theoretical grounding on Sustainable Systems (SS) thinking and overview of national and international frameworks that have led to development and use of sustainable systems modeling, life cycle analysis and policy decision models. Topics include socio-metabolic consumption, sustainability as a field of inquiry, systems thinking, industrial ecology, earth systems engineering, complexity and resiliency. Explore current drivers and implications of sustainable systems with specific focus on nexus of industry and environmental systems including examining cumulative impacts and benefits resulting from shifting supply chains, green engineering, technological designs and consumer behavior. Instructor consent required.

ENVIRON812 - Wetlands Ecology and Management

Subject ENVRON
Catalog Number 812
Title Wetlands Ecology and Management

Description
The study of bogs, fens, marshes, and swamps. Emphasis on processes within the ecosystem: biogeochemical cycling, decomposition, hydrology, and primary productivity. Ecosystem structure, the response of these systems to perturbations, and management strategies are discussed. A research project is required. Prerequisites: one course in ecology and chemistry.

ENVIRON814 - Integrated Case Studies in Toxicology
### ENVIRON815 - Focused Topics in Toxicology

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<tbody>
<tr>
<td>ENVIRON</td>
<td>815</td>
<td>Focused Topics in Toxicology</td>
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</tbody>
</table>

**Description**
A contemporary advanced toxicology research area covered with readings from the current primary literature. An integrative review of the topic prepared as a collaborative effort. Consent of instructor required. Prerequisites: Pharmacology 533 and 847S.

### ENVIRON819 - Mechanisms in Environmental Toxicology

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<th>Subject</th>
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<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>819</td>
<td>Mechanisms in Environmental Toxicology</td>
</tr>
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</table>

**Description**
Provides an in-depth examination of key molecular and biochemical mechanisms by which organisms defend themselves against environmental pollutants. Cellular mechanisms by which chemicals produce toxicity when the defense systems are overwhelmed will be addressed. Includes examinations of "state of the art" approaches for experimentally elucidating these phenomena. Course format will be that of a graduate seminar, with lectures given and discussions led by the instructors, guest speakers, and course participants. Prerequisites: one course in biochemistry and one course in toxicology.

### ENVIRON820S - Conservation Ethics

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<th>Subject</th>
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<th>Title</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>820S</td>
<td>Conservation Ethics</td>
</tr>
</tbody>
</table>

**Description**
Students will delve into the tension between science and advocacy through the lens of environmental ethics. Students will gain a strong foundation in principles of environmental ethics, drawing from the rich literature on this topic from the fields of philosophy and ethics, environmental communications and education, and conservation ecology. Seminar-style course requires students to actively lead and participate in weekly discussions, write a series of essays and collaboratively design and initiate a semester project. Ultimately, the course is about reflecting on not just the academic literature and individual scenarios but seriously considering the role our own values play in our work.

### ENVIRON821 - Advanced Readings in Soil Science

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>821</td>
<td>Advanced Readings in Soil Science</td>
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</tbody>
</table>

**Description**
An advanced discussion course based on readings that concern current critical topics in the soil sciences. Readings are selected from both basic and applied aspects of the field.
ENVIRON822A - Coastal Watershed and Policy

Description:
Examine hydrology of coastal watersheds and how watershed modifications impact estuaries and near shore coastal ecosystems. Hydrologic functioning of natural unaltered watersheds is contrasted with changes caused by man's modification of those systems. Include discussion of efforts to remedy impacts through installation of Best Management Practices and wetlands restoration. Emphasis on gaining understanding of what the impacts of hydrologic change are on biology of coastal waters as watershed development alters the physics, chemistry, and geology of coastal waters. Includes field trips to watersheds in coastal North Carolina. Taught in Beaufort at Duke Marine Lab.

ENVIRON823 - Ecological Resilience and Ecosystem Management

Description:
Course provides an introduction to concepts of ecological resilience and its application to the management of ecological systems, and is intended for both PhD and MEM students. The course does not require formal mathematical training, but students are expected to engage the models used in this field. Course consists of lectures, discussion, and a group research project. Lectures will address fundamental theory, case studies, and empirical approaches used to understand the resilience of basic ideas, observations, and approaches to understanding the ecology of flowing water systems.

ENVIRON824A - Marine Conservation Biology

Description:
Introduction to marine conservation in a small island context with an exploration of how traditional and modern methods play out in practice. Most of the course will be taught in Palau, where students will meet traditional chiefs, fishers, state governors, NGO practitioners, scientists and politicians to hear their perspectives on marine conservation. The course will focus on the theory and practice of marine conservation, as exemplified by case studies in traditional management, marine protected areas, conservation of protected species and ecotourism. Taught in Beaufort at Duke Marine Lab. Trip to Palau required. Permission required.
ENVIRON825LA - Marine Molecular Microbiology

Subject: ENVIRON
Catalog Number: 825LA
Title: Marine Molecular Microbiology

Description:
Covers a broad overview of the ecological and biogeochemical role that microbes play in marine environments. Lab exercises focus on applying molecular techniques to the study of microbial ecology. Taught in Beaufort at Duke Marine Lab.

ENVIRON826 - Global Environmental Politics

Subject: ENVIRON
Catalog Number: 826
Title: Global Environmental Politics

Description:
Course examines how states and non-states actors cooperate to resolved global environmental problems. Central focus is on the creation of international environmental regimes, their implementation, and effectiveness. Case studies include climate change, ozone depletion, water sharing and dams, fisheries, biodiversity, forestries, oil pollution, sustainable development, environmental security, and trade and the environment.

ENVIRON829 - Natural Resource Economics

Subject: ENVIRON
Catalog Number: 829
Title: Natural Resource Economics

Description:
Addresses questions about natural resource scarcity using modern capital theory and optimal control theory to derive core results. Two objectives: provide students with a solid foundation in theory of natural resource economics, emphasizing tools and theoretical breadth to enhance research and teaching. Second objective to highlight contemporary themes in theoretical and empirical resource economics. Designed for PhD students in economics, finance, agriculture and resource economics, or public policy (with economics concentration). Prerequisite: one year PhD-level microeconomic theory and econometrics; review of differential equations recommended. Consent of instructor required.

ENVIRON829D - Natural Resource Economics

Subject: ENVIRON
Catalog Number: 829D
Title: Natural Resource Economics

Description:
Addresses questions about natural resource scarcity using modern capital theory and optimal control theory to derive core results. Two objectives: provide students with a solid foundation in theory of natural resource economics, emphasizing tools and theoretical breadth to enhance research and teaching. Second objective to highlight contemporary themes in theoretical and empirical resource economics. Designed for PhD students in economics, finance, agriculture and resource economics, or public policy (with economics concentration). Prerequisite: one year PhD-level microeconomic theory and econometrics; review of differential equations recommended. Consent of instructor required.

ENVIRON830 - Building Energy on Campus: Evaluating Efficiency and Conservation Measures at Duke
Building Energy on Campus: Evaluating Efficiency and Conservation Measures at Duke

Buildings use more than 40% of the energy consumed in the US, and are a natural target of energy efficiency and conservation measures. Building owners and facility managers, as well as the policy community, are therefore interested in identifying means of reducing energy consumption in the current building stock and taking advantage of the embodied energy already sunk into its construction. Using the campus as a laboratory, course examines energy use in existing Duke buildings. Students will learn about the relationship between building design and energy use, and gain hands-on experience conducting energy audits and evaluating energy saving measures in campus facilities.

Sustainable Business Strategy

Businesses are increasingly applying strategic management tools to incorporate consideration of sustainability into decision-making and operations. While some businesses incorporate sustainable practices because of ethical convictions, most businesses are motivated to do so to address pressures from stakeholders such as regulators, shareholders, customers and neighbors and to exploit knowledge and experience for long term competitive advantage. Students will learn how businesses develop and implement strategies to promote sustainability by examining roles and responsibilities of sustainable strategic managers and applying tools of strategic business management to problems of sustainability. Permission of instructor required.

Environmental Decision Analysis

Quantitative methods for analyzing environmental problems involving uncertainty and multiple, conflicting objectives. Topics include subjective probability, utility, value of information, multi-attribute methods. Students will apply these tools to an environmental policy decision in a group project. Prerequisite: introductory applied statistics or equivalent.

Environmental Law
Duke University

**ENVIRON835K - Environmental Law**

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<tbody>
<tr>
<td>ENVIRON</td>
<td>835K</td>
<td>Environmental Law</td>
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</tbody>
</table>

**Description**

Emphasizing the practical use and application of legal concepts within the context of pollution control and resource management; exploring the role of law, regulation and governance in protecting, managing and restoring the environment and natural resources. Taught in China at Duke Kunshan University.

**ENVIRON836 - Seabird Survival and Dispersal Analysis**

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<tbody>
<tr>
<td>ENVIRON</td>
<td>836</td>
<td>Seabird Survival and Dispersal Analysis</td>
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</tbody>
</table>

**Description**

Client-inspired class held at the Dry Tortugas National Park (near Key West). The principal field activity will be catching, ringing and measuring sooty terns as part of a National Park Service effort. The graduate version of this course has close similarities to the undergraduate class. Both classes will travel together and be expected to catch, ring and process the same numbers of birds. The graduate version differs in the written expectations. These vary somewhat, but have included very extensive documents that eventually comprised the student's master's project and considerable post-trip involvement with the professor and Park Service personnel—such projects are encouraged but not guaranteed. Instructor consent required. Prerequisite: Environment 703.

**ENVIRON841 - Ecological Perspectives: Evolution to Ecosystems**

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<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tr>
<td>ENVIRON</td>
<td>841</td>
<td>Ecological Perspectives: Evolution to Ecosystems</td>
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</table>

**Description**

This course surveys core concepts in evolutionary and ecosystems ecology, and it challenges students to develop intersections and creative syntheses across those disciplines.

**ENVIRON842 - Ecological Perspectives: Individuals to Communities**

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<th>Subject</th>
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<tbody>
<tr>
<td>ENVIRON</td>
<td>842</td>
<td>Ecological Perspectives: Individuals to Communities</td>
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</tbody>
</table>

**Description**

This course surveys core concepts in Physiological/Behavioral/Population Ecology and Community Ecology, and it challenges students to develop intersections and creative syntheses across those disciplines.
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<tr>
<td>ENVIRON</td>
<td>847S</td>
<td>Seminar in Toxicology</td>
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<tr>
<td>ENVIRON</td>
<td>848S</td>
<td>Seminar in Toxicology</td>
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<tr>
<td>ENVIRON</td>
<td>849A</td>
<td>Doctoral Student Seminar and Professional</td>
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<td>Development</td>
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<tr>
<td>ENVIRON</td>
<td>859</td>
<td>Geospatial Data Analytics</td>
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<tr>
<td>ENVIRON</td>
<td>859A</td>
<td>Geospatial Data Analytics</td>
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<tr>
<td>ENVIRON</td>
<td>859D</td>
<td>Geospatial Data Analytics</td>
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**ENVIRO847S - Seminar in Toxicology**

**Description**

A weekly research seminar throughout the year is required of participants in the Toxicology Program. Students, faculty, and invited speakers present their findings.

**ENVIRO848S - Seminar in Toxicology**

**Description**

A weekly research seminar throughout the year is required of participants in the Toxicology Program. Students, faculty, and invited speakers present their findings.

**ENVIRO849A - Doctoral Student Seminar and Professional Development**

**Description**

Addresses topics of relevance to the professional development of PhD students in the Marine Science Conservation program. Topics addressed include: the nature of inter-disciplinary research, critical reading, grant writing, communicating results to the public, mentoring students, and preparing manuscripts for academic journals. Taught in Beaufort at Duke Marine Lab.

**ENVIRO859 - Geospatial Data Analytics**

**Description**

Provide training in more advanced skills such as: GIS database programming, modeling applications, spatial decision support systems and Internet map server technologies. The course requires a fundamental knowledge of geospatial analysis theory, analysis tools, and applications. Consent of instructor required. Prerequisite: Environment 559 and Environment 761, 765, or 789.

**ENVIRO859A - Geospatial Data Analytics**

**Description**

Provide training in more advanced skills such as: GIS database programming, modeling applications, spatial decision support systems and Internet map server technologies. The course requires a fundamental knowledge of geospatial analysis theory, analysis tools, and applications. Taught in Beaufort at Duke Marine Lab. Recommended prerequisite: Environment 559 and Environment 761, 765, or 789. Instructor consent required.

**ENVIRO859D - Geospatial Data Analytics**
Subject: ENVIRON
Catalog Number: 859D
Title: Geospatial Data Analytics

Description:
Provide training in more advanced skills such as: GIS database programming, modeling applications, spatial decision support systems and Internet map server technologies. The course requires a fundamental knowledge of geospatial analysis theory, analysis tools, and applications. Consent of instructor required. Prerequisite: Environment 559 and Environment 761, 765, or 789.

Subject: ENVIRON
Catalog Number: 859DA
Title: Geospatial Data Analytics

Description:
Provide training in more advanced skills such as: GIS database programming, modeling applications, spatial decision support systems and Internet map server technologies. The course requires a fundamental knowledge of geospatial analysis theory, analysis tools, and applications. Taught in Beaufort at Duke Marine Lab. Recommended prerequisite: Environment 559 and Environment 761, 765, or 789. Instructor consent required.

Subject: ENVIRON
Catalog Number: 860SA
Title: Political Ecology

Description:
Seminar to examine concept of political ecology as means of conceptualizing conservation and development conflicts and solutions. Intended to engage students with political ecology to strengthen usefulness, enrich possibilities, and improve participants ongoing research, collaborations and critical inquiries. Enrollment limited to graduate students. Taught in Beaufort at Duke Marine Lab.

Subject: ENVIRON
Catalog Number: 865SA
Title: College Teaching and Course Design

Description:
Designed for graduate students seeking to teach an independent course at Duke and beyond; topics include models of course design, syllabus construction, critical thinking, college student development, clarifying learning objectives, variety in assignments, and classroom assessment techniques. Taught in Beaufort at Duke Marine Lab.

Subject: ENVIRON
Catalog Number: 868
Title: Natural Resources Law

Description:
Focus on constitutional, statutory, and common law governing the legal status and management of federal lands and natural resources.

Subject: ENVIRON
Catalog Number: 869
Title: Environmental Law Clinic
ENVIRON869D - Environmental Law Clinic

Under Law faculty supervision, students work on interdisciplinary teams to solve nonprofit clients’ legal and policy problems. Students gain hands-on, skills-based professional experience. Clinic follows Law School’s academic calendar. Minimum 100 client work hours plus weekly seminar; mandatory, all-day intensive, typically 2nd Friday of semester; no dropping after 1st class. Nicholas School students may enroll starting in their second semester. Suggested corequisite: Environment 835. More information is available at: https://law.duke.edu/envlawpolicy/.

ENVIRON872L - Environmental Data Analytics

Environmental data analytics introduces fundamental data skills needed to conduct research. We explore a variety of techniques and technologies for obtaining, re-formating, managing, and visualizing diverse data sets with an emphasis on developing reproducible workflows and sharing both methods and results. We will use actual environmental data (hydrologic, demographic, energy, etc.) in class exercises, but students will have the opportunity to involve their own data sets.

ENVIRON872L-1 - Environmental Data Analytics

Environmental data analytics introduces fundamental data skills needed to conduct research. We explore a variety of techniques and technologies for obtaining, re-formating, managing, and visualizing diverse data sets with an emphasis on developing reproducible workflows and sharing both methods and results. We will use actual environmental data (hydrologic, demographic, energy, etc.) in class exercises, but students will have the opportunity to involve their own data sets. Instructor consent required.

ENVIRON876A - Data and Time Series Analysis in Marine Sciences
**ENVIRON886 - Current Topics in Marine Conservation**

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<tr>
<th>Subject</th>
<th>Catalog Number</th>
<th>Title</th>
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<tr>
<td>ENVIRON</td>
<td>886</td>
<td>Current Topics in Marine Conservation</td>
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</tbody>
</table>

**Description**

Discussion of a topic of interest chosen by students with guidance from instructors. Topic is discussed from a social and natural science perspective. Open only to PhD students.

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**ENVIRON886A - Current Topics in Marine Conservation**

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<tbody>
<tr>
<td>ENVIRON</td>
<td>886A</td>
<td>Current Topics in Marine Conservation</td>
</tr>
</tbody>
</table>

**Description**

Discussion of a topic of interest chosen by students with guidance from instructors. Topic is discussed from a social and natural science perspective. Open only to PhD students. Taught in Beaufort at Duke Marine Lab.

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**ENVIRON887A - Theory and Methods for Policy Analysis of the Commons**

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<tr>
<td>ENVIRON</td>
<td>887A</td>
<td>Theory and Methods for Policy Analysis of the Commons</td>
</tr>
</tbody>
</table>

**Description**

Survey course of main theories and methods used by scholars to understand how collective action problems and different institutional arrangements affect how common-pool resources and public goods are governed. Students are asked to design a project that incorporates some of the concepts and methodological approaches learned in class. Taught in Beaufort at Duke Marine Lab.

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**ENVIRON888 - Career Development for Environmental Professionals**

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<tr>
<td>ENVIRON</td>
<td>888</td>
<td>Career Development for Environmental Professionals</td>
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</table>

**Description**

This course surveys career development strategies, activities, and experiences for MEM/MF graduate students, specifically those with less than three years of work experience. It emphasizes use of these elements in a successful internship search. Students will apply these strategies to their own career journey and have opportunity to interact with alumni during this course. No prerequisites. Course offered as one credit that doesn't count toward graduation.
ENviron891 - Topics in Environmental Regulation

**Subject**
ENviron

**Catalog Number**
891

**Title**
Topics in Environmental Regulation

**Description**
In-depth analysis of current issues in environmental regulation. Topics vary. Course may be repeated.

ENviron893 - MEM/MF Internship Practical Training

**Subject**
ENviron

**Catalog Number**
893

**Title**
MEM/MF Internship Practical Training

**Description**
Students gain practical environmental management or forestry experience/training by participating in a project-based internship. Open only to Master of Environmental Management and Master of Forestry students. Instructor consent required.

ENviron894 - Writing, Publishing and Reviewing Scientific Papers

**Subject**
ENviron

**Catalog Number**
894

**Title**
Writing, Publishing and Reviewing Scientific Papers

**Description**
Grad students in ecology, biology, forestry & related disciplines who desire skills in the language of science and how info is disseminated. To learn to write clearly & concisely for effective communication for publication, to express scientific ideas & results and persuade others by the merits of scientific writing in peer-review & eventual publication; to find relevant articles in citation databases, to understand the publication system from the point of view of author/editor/reviewer; what impact factors represent; how to write a convincing letter accompanying your submission & the stages of review; and develop the students' abilities to read/write/present & critique scientific literature.

ENviron895 - Master of Environmental Management/Forestry Internship/Project

**Subject**
ENviron

**Catalog Number**
895

**Title**
Master of Environmental Management/Forestry Internship/Project

**Description**
Students gain practical environmental management or forestry experience by participating in a project-based internship. Focus areas in the Stanback Program include energy, conservation, advocacy, policy, research, or other environmental management and/or forestry practical opportunities. Open only to Master of Environmental Management or Master of Forestry students.

ENviron896 - Professional Communications
**ENviron897 - Writing a Master's Project**

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<tr>
<td>ENVIRON</td>
<td>897</td>
<td>Writing a Master's Project</td>
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</table>

**Description**

This is the second of two half credit courses in professional communications. To be taken in the second fall of enrollment in the MEM or MF degree, this course addresses different aspects of writing a master's project. Course will include a mixture of lecture and in-class workshopping of written materials. Course covers writing introductions, background sections, methods, writing results, discussion, conclusions, executive summaries and developing a professional website. Open only to MEM and MF students.

**ENviron898 - Program Area Seminar**

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<th>Subject</th>
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<tr>
<td>ENVIRON</td>
<td>898</td>
<td>Program Area Seminar</td>
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</table>

**Description**

Required symposium in each program area. Students present master's project research. Pass/fail grading only.

**ENviron898A - Topic: Program Area Seminar - Duke University Marine Lab**

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<th>Subject</th>
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<th>Title</th>
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<tr>
<td>ENVIRON</td>
<td>898A</td>
<td>Topic: Program Area Seminar - Duke University Marine Lab</td>
</tr>
</tbody>
</table>

**Description**

Required symposium in each program area. Students present master's project research. Pass/fail grading only. Taught in Beaufort at Duke Marine Lab.

**ENviron898K - Master's Project International Master in Environmental Policy II**

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<th>Subject</th>
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<tr>
<td>ENVIRON</td>
<td>898K</td>
<td>Master's Project International Master in Environmental Policy II</td>
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</table>

**Description**

Designed to help students develop a master's project (MP). Guide students in conceptualizing an idea, identifying key environmental policy question, writing a prospectus, finding an advisor, finding a client, designing an analytical approach, data collection, and a producing a draft of their project. Taught at Duke Kunshan University.
# ENVIRON899 - Master's Project

**Subject**: ENVIRON  
**Catalog Number**: 899  
**Title**: Master's Project  

**Description**
An applied study of a forestry or environmental management problem or a theoretical research effort. A seminar presentation of the objectives, methodology, and preliminary findings is required. A written (or other medium) report at the conclusion of the project is also required. Undertaken with the guidance of the student's adviser. Consent of instructor required. Pass/fail grading only.

# ENVIRON899K - Master's Project II

**Subject**: ENVIRON  
**Catalog Number**: 899K  
**Title**: Master's Project II  

**Description**
Follows after Environment 898K, in which students conceived of, designed, and completed the initial steps of their master's project (MP). Students will complete their MP and present project findings. Students will review and revise project content in peer-to-peer and instructor-to-student settings, critically evaluate their methods and data, search for new ways to leverage their findings, and tighten their resulting analysis. Required course for iMEP students. Taught at Duke Kunshan University.

# ENVIRON909 - Survey of Environmental Leadership at Duke and Beyond

**Subject**: ENVIRON  
**Catalog Number**: 909  
**Title**: Survey of Environmental Leadership at Duke and Beyond  

**Description**
Students invite Duke faculty to share their perspectives on environmental leadership with a series of web conferences. Students will read a range of scholarly work from these faculty, as well as key readings in the environmental leadership literature. Grade will be based on participation in class meetings, online discussions, and a short summary paper. Consent of instructor is required. Online course.

# ENVIRON931 - One Health: Introduction to the One Health Approach

**Subject**: ENVIRON  
**Catalog Number**: 931  
**Title**: One Health: Introduction to the One Health Approach  

**Description**
6-day morning course introduces principles of employing the One Health approach in preventing and controlling infectious diseases. Includes practical overview of host factors, environmental factors, and microbiological factors that influence this dynamic field of study. Through lectures and exercises, introduces infectious disease surveillance, diagnostic tools, outbreak investigations, vaccine trials, public health interventions, biodefense, emerging infectious diseases and analytical approaches as they pertain to infectious disease prevention and control. Introduces wide array of reference material for practical application of course material.

# ENVIRON932 - One Health: Introduction to Environmental Health
ENVIRON932 - One Health: Introduction to Environmental Health

Description
Course provides a comprehensive overview of major topic areas in Environmental Health. Includes major sources of environmental health risks, such as microbial, chemical, and physical agents in natural and anthropogenic environments. Also covers topics of toxicology and ecotoxicology, risk assessment and risk management, water and sanitation issues, infectious diseases, food safety, and other emerging topics.

ENVIRON938 - One Health: Introduction to Entomology, Zoonotic Diseases, and Food Safety

Description
Course introduces public health students to entomology, zoonotic diseases, and principals of modern food safety. Includes methods for conducting studies of mosquitoes and ticks, controlling zoonotic diseases, and protecting the food supply. Special focus on modern food safety techniques in meat, dairy and produce production. Lectures complemented with considerable laboratory and/or field work.

ENVIRON939 - One Health: Public Health Laboratory Techniques

Description
Introduction to common laboratory techniques used in emerging infectious respiratory disease research and surveillance laboratories; emphasis on techniques for culturing, characterization, and serological surveillance of exposure to influenza viruses.

ENVIRON955 - DEL: Community-Based Environmental Management

Description
Course combines analysis of potential problems and pitfalls involved in community-based environmental management with discussion of the tools necessary to create and manage these projects. Focus is on discussion of academic literature with presentations of specific case studies and analysis of a community program in students' proximity. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

ENVIRON959 - DEL: Intro to ArcGIS Pro Exercises
ENVIRON960 - Duke Environmental Leadership: Orientation Course: Making a Difference in the World

Description
One-week course to introduce the curriculum of the Duke Environmental Leadership (DEL) program. Provides framework for program studies. Focus on real-world environmental challenges and timely case studies. Field studies in Durham and at Duke University Marine Lab, Beaufort, NC. Open to Duke Environmental Leadership Master of Environmental Management students only.

ENVIRON961 - Duke Environmental Leadership: Ecosystem Science and Management

Description
This course will explore the challenges of managing ecosystems by focusing on both structure (i.e. species, populations, communities) and function (i.e. ecosystem services), grounded in the best available science. We will examine how humans have transformed landscapes and evaluate management strategies for both terrestrial and marine systems. Students will gain the scientific grounding and the practical skills necessary to evaluate the use of science in mgmt efforts through a semester-long case study project, mini-presentations, and writing assignments. Discussions will focus on current controversies in conservation science. Open to DEL-MEM students only. Online course.

ENVIRON962 - Duke Environmental Leadership: Economics of Environmental Management

Description
An economic perspective on the management of env. resources. Conceptual topics emphasized include env. externalities, market failure, public goods, sustainability, and benefit-cost analysis. Applications illustrate the role of price signals in energy choices, managing renewable resource use over time, use of marketable pollution permits to encourage voluntary reductions in air and water pollution, and the political economy of env. policy formulation. Case studies examine carbon trading and taxes to address climate change, and economic incentives and values for biodiversity conservation. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

ENVIRON963 - DEL: Program Management for Environmental Professionals
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<tr>
<td>ENVIRON</td>
<td>963</td>
<td>DEL: Program Management for Environmental Professionals</td>
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</table>

**Description**

In the private and public sectors, as well as not-for-profit organizations, managerial effectiveness is central to environmental leadership. This course will focus on the development of management skills including decision-making, motivation, working in teams, organizational cultures, organizational design, learning organizations and change management. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

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<tr>
<td>ENVIRON</td>
<td>964</td>
<td>Duke Environmental Leadership: Environmental Law and Policy</td>
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</table>

**Description**

Environmental policies have evolved from strict reliance on command and control systems to experimentation with alternative approaches. In this course students study this evolution by first examining the history and context of U.S. policy development processes and institutions. Command approaches to air and water pollution and waste management are considered along with alternative approaches, such as market-based programs, public-private partnerships and voluntarism. Policies for managing land, natural resources, species protection and addressing transnational and global environmental problems are examined. Policy implementation and devolution of responsibilities to state and local governments and the private sector is stressed. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

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<tr>
<td>ENVIRON</td>
<td>965</td>
<td>DEL: Environmental Leadership Module</td>
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</table>

**Description**

One of the driving themes of the DEL-MEM Program is leadership. We believe that leadership is cultivated by each individual and requires time and effort; it is a process. Participation in the DEL-MEM program will put students one step closer in their leadership pursuit by providing opportunities to assess and enhance leadership skills, building confidence in critical and creative thinking, communication, collaboration and conflict resolution. This course is designed to orient students towards these goals. More specifically, to provide a framework and point of reference for students' leadership development. During the three-day session, we will explore leadership in a variety ways, including individual meetings with prominent leaders in the field, discussions, and case study project. Students will also experience Washington, D.C. through a tour of the Capitol, meetings with Congressional members and staff, and time on the Mall. Open to Duke Environmental Leadership Master of Environmental Management students only.

**ENVIRON966 - DEL: Professional Writing Course**
ENVIRON973 - DEL: Business Strategy for Environmental Sustainability

Description
Businesses are increasingly applying strategic management tools to incorporate considerations of sustainability into decision-making and operations. Course focuses on the development and implementation of strategies to promote environmental sustainability. Students examine roles and responsibilities of sustainable strategic managers and learn how to apply the tools of strategic management: external analysis, forecasting, and stakeholder management to problems of sustainability. Business case studies are used. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

ENVIRON974 - DEL: Seeing the Big Picture: Lessons from Watershed Management in California

Description
This course is an exploration of the interdisciplinary and often controversial nature of watershed management in California using examples from arguably the most manipulated and well-studied watershed in the US. These problems and their solutions are relevant to all watersheds. Topics include: host factors governing fish and wildlife responses and effects; fate, transport, and biogeochemistry of agricultural chemicals; exotic species introduction; economics considerations governing water allocations storage; transport, and conservation; and conflict resolution efforts between competing interest groups. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

ENVIRON975 - DEL: Community Based Environmental Management in Mexico

Description
Class offers students a focused introduction to the general history of rural common property governance and resource politics and management in Mexico and to the specific history and current context of community environmental management in Oaxaca. Requires participation in week long field trip (spring break) to Oaxaca (additional costs involved). Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students.
### ENVIRON976 - DEL: Restoration Ecology: Practice and Principles

**Subject**: ENVIRON  
**Catalog Number**: 976  
**Title**: DEL: Restoration Ecology: Practice and Principles

**Description**
Class explores the fundamental principles of ecological restoration with a socio-ecological lens. Students will use the restoration process as a framework for understanding how science informs practice, and vice versa. Case studies in both terrestrial and marine systems will be used, and students will apply lessons learned in an ecosystem of their choosing. Open to Duke Environmental Leadership Master of Environmental Management students, with department consent required of all other students.

### ENVIRON979 - DEL: The Science of Climate Change

**Subject**: ENVIRON  
**Catalog Number**: 979  
**Title**: DEL: The Science of Climate Change

**Description**
This course will provide students with a broad, policy-relevant overview of contemporary scientific understanding of climate change. The recently released IPCC Fourth Assessment Report (IPCC AR4) titled 'Climate Change 2007' will provide the framework for discussion of various aspects of climate change, including the fundamental physical science basis, potential impacts and vulnerability, and mitigation of climate change. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

### ENVIRON980 - DEL: California Water Management Field Trip

**Subject**: ENVIRON  
**Catalog Number**: 980  
**Title**: DEL: California Water Management Field Trip

**Description**
California has long been the poster child for conflict over water management and appropriation. Much of that conflict has focused on the diversion of water from the Sierra Nevada and the Great Central Valley. In this 5-day field course we will provide an overview of the hydrology and history of water development of the Central Valley, and focus on three case studies: Hetch Hetchy, the Californian Aquaduct, and the re-watering of the San Joaquin River. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students.

### ENVIRON982 - DEL: Sustainable Development in Colombia

**Subject**: ENVIRON  
**Catalog Number**: 982  
**Title**: DEL: Sustainable Development in Colombia

**Description**
The course will provide students with an international perspective and explores topics such as sustainable economy, renewable energy, conservation, ecotourism and sustainable rural development in Colombia. Currently Colombia is going through a systemic transition after decades of internal conflict. During spring break, students will travel to Colombia to assist in several meetings in Bogotá, and later to Barranquilla, Santa Marta and La Guajira to explore and experience ecotourism and conservation initiatives, energy transitions taking place from coal to solar and wind, as well as exchanging experiences with sustainable economies of indigenous peoples of Wayuu and Arhuaco communities.

### ENVIRON983 - DEL: Green Development
ENVIRON983 - DEL: Green Development

Description
This course will cover green building, smart cities, and related cleantech innovations. Students will explore these topics through the lenses of business strategy, corporate sustainability drivers, challenges and risks, global megatrends, investor perspectives, entrepreneurship, measures of success, and implementation tools. Teaching methods will include case studies, practice-oriented assignments, readings from industry and thought leaders, structured group discussions, and skill building such as professional memo writing. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students.

ENVIRON985 - DEL: Energy, Environment and the Law

Description
Examines legal framework governing energy production and consumption in US, environmental issues associated with the nation's energy sectors, and policy approaches for balancing energy needs with environmental protection. Three main sections: state utility regulation; energy resources for electricity generation; petroleum. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students. Online course.

ENVIRON990 - DEL: Special Topics

Description
Content to be determined each semester. May be repeated. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students.

ENVIRON995 - DEL: Leadership Seminar

Description
Leadership is both a way of doing things and a way of being in the world. Now, more than ever, leaders need to work collaboratively if we are to solve our greatest collective challenges. To do so effectively, those who aspire to lead must develop a deep sense of both internal and external awareness. Course focus areas: Developing a Toolkit, Defining a Leadership Journey, Ongoing Discussion of Leadership Challenges and Coaching through the use of various tools to identify personal characteristics and capacity for leadership.

ENVIRON996 - DEL MEM Capstone
ENVIRON997 - Duke Environmental Leadership: Independent Studies and Projects

Subject
ENVIRON
Catalog Number
997
Title
Duke Environmental Leadership: Independent Studies and Projects

Description
Directed readings or research at the graduate level to meet the needs of individual students. Open to Duke Environmental Leadership-Master of Environmental Management students only. Instructor consent required.

ENVIRON998 - Program Area Seminar DEL MEM

Subject
ENVIRON
Catalog Number
998
Title
Program Area Seminar DEL MEM

Description
This program seminar is required for all Duke Environmental Leadership (DEL) MEM students. The seminar will assist students in all phases of the master's project (MP) process, from developing research questions to presenting results. Instructor consent required.

ENVIRON999 - Duke Environmental Leadership: Master's Project

Subject
ENVIRON
Catalog Number
999
Title
Duke Environmental Leadership: Master's Project

Description
An applied study of a forestry or environmental management problem or an original research effort. A seminar presentation of the objectives, methodology, and preliminary findings is required. A written (or other medium) report at the conclusion of the project is also required. Undertaken with the guidance of the student's adviser. Open to Duke Environmental Leadership Master of Environmental Management students only. Department consent required for all other students.

EOS701S - Research Orientation Seminar

Subject
EOS
Catalog Number
701S
Title
Research Orientation Seminar

Description
Introduction to resources, skills, and practices for conducting research in earth and ocean sciences, with emphasis on written and oral communication. Required of all entering graduate students in Earth and Climate Sciences. Consent of director of graduate studies required.
**EOS704LA - Biological Oceanography**

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<tr>
<th>Subject</th>
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<tbody>
<tr>
<td>EOS</td>
<td>704LA</td>
<td>Biological Oceanography</td>
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</tbody>
</table>

**Description**

Patterns of abundance, diversity and activity of organisms in major ocean ecosystems. Identifies major physical, chemical and ecological processes that affect these patterns, and analyzes the impact of biology on ecosystems. Uses "flipped" classroom emphasizing hands-on data collection and quantitative analyses, field trips aboard DUML research vessels, and participatory activities to demonstrate core concepts in biological oceanography. Taught in Beaufort at Duke Marine Lab. Spring enrollment requires travel. Graduate section includes experimental design component and research paper on final project.

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**EOS715 - Introduction to Coastal Environmental Change Processes**

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<tr>
<td>EOS</td>
<td>715</td>
<td>Introduction to Coastal Environmental Change Processes</td>
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</table>

**Description**

Nearshore physical processes responsible for the evolution of beaches and barrier islands. Various problems and possible solutions arising from human development of retreating shorelines. Involves a field trip and research paper.

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**EOS716A - Beach and Island Geological Processes**

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<tr>
<td>EOS</td>
<td>716A</td>
<td>Beach and Island Geological Processes</td>
</tr>
</tbody>
</table>

**Description**

Field seminar on the evolution of beaches and barrier islands with emphasis on the interactions between nearshore processes and human development. Prerequisite: Earth and Climate Sciences 315/515 or consent of instructor. Also taught as Earth and Climate Sciences 316A.

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**EOS722 - Hydrologic and Environmental Data Analysis**

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<td>EOS</td>
<td>722</td>
<td>Hydrologic and Environmental Data Analysis</td>
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</tbody>
</table>

**Description**

Course will focus on acquisition of skills necessary to extract information from observations of hydrological and environmental processes, connect the extracted information with the physical processes generating the data, and estimate physical quantities at ungauged location/times. Emphasis on process understanding via data analysis techniques. Applications used as a way to understand the general concepts, with examples drawn from water science. Prerequisites: Basic computer skills, Algebra, Calculus are required. Experience with computational software (e.g. Matlab or R) is helpful but not required.

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**EOS723 - Hydrology in Environmental Management**
## Duke University

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<tr>
<td>EOS</td>
<td>723</td>
<td>Hydrology in Environmental Management</td>
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<tr>
<td>EOS</td>
<td>723D</td>
<td>Hydrology</td>
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<tr>
<td>EOS</td>
<td>785DS</td>
<td>Analyzing Current Contributions in Earth,</td>
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<td>Atmospheric and Climate Sciences</td>
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<tr>
<td>EOS</td>
<td>785S</td>
<td>Analyzing Current Contributions in Earth,</td>
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**Description**

An introduction to hydrology by examining how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater with emphasis on hydrological processes inside watersheds. Topic areas include: hydrologic cycle and water balances, evapotranspiration and snow energy balances, vadose zone hydrology, hydrogeology, hyporheic zones, riparian zones, streamflow generation mechanisms, biogeochemical budgets, and field measurement techniques. Linkages between physical hydrology and broader ecological and environmental sciences will be highlighted. Includes local field trips.

### EOS723D - Hydrology

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<td>723D</td>
<td>Hydrology</td>
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**Description**

An introduction to hydrology by examining how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater with emphasis on hydrological processes inside watersheds. Topic areas include: hydrologic cycle and water balances, evapotranspiration and snow energy balances, vadose zone hydrology, hydrogeology, hyporheic zones, riparian zones, streamflow generation mechanisms, biogeochemical budgets, and field measurement techniques. Linkages between physical hydrology and broader ecological and environmental sciences will be highlighted. Includes local field trips.

### EOS785DS - Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences

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**Description**

Analyzing and discussing journal articles about a range of timely topics across the Earth and climate sciences. Each paper is associated with the research to be presented by the upcoming speaker in the Earth and Climate Sciences (ECS) seminar series. Faculty and senior graduate students rotate to provide background lectures needed to understand the paper/seminar, which will expose students to basic concepts from the wide range of research sub-fields represented within the Earth and Climate Sciences program. Meets twice per week, with one class meeting devoted to each ECS seminar (approximately every second week). Consent of director of graduate studies required.

### EOS785S - Analyzing Current Contributions in Earth, Atmospheric and Climate Sciences

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**Description**

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EOS790 - Special Topics in Earth and Ocean Sciences

Subject: EOS  
Catalog Number: 790  
Title: Special Topics in Earth and Ocean Sciences

Description: Content to be determined each semester. Consent of instructor required.

EOS790S - Advanced Topics in Geology

Subject: EOS  
Catalog Number: 790S  
Title: Advanced Topics in Geology

Description: Topics, instructors, and credits to be arranged each semester.

EOS791 - Independent Study

Subject: EOS  
Catalog Number: 791  
Title: Independent Study

Description: Consent of instructor required.

EOS792S - Microgrid Seminar

Subject: EOS  
Catalog Number: 792S  
Title: Microgrid Seminar

Description: This seminar will focus on designing and costing microgrids. Microgrids range from building to campus to community power systems that are connected to the conventional electric grid but can be islanded off from it, to systems that power remote facilities beyond and thus totally disconnected from the grid. Designing a microgrid entails more than simply hooking up distributed generation technologies to one or more loads. It also involves understanding existing regulations and the circumstances under which they can be connected, resolving ownership, etc. This seminar will explore how to analyze both load data and data on local renewable energy resource potential. Prerequisite: Environment 631, 711, and 716L.

REG703 - Nicholas School Study Away

Subject: REG  
Catalog Number: 703  
Title: Nicholas School Study Away

Description: Nicholas School Study Away

RELIGION911 - Religious Material Culture in Theory and Practice
Subject: RELIGION
Catalog Number: 911
Title: Religious Material Culture in Theory and Practice

Description:
Examines prevailing theories and methods of studying objects, spaces, images, and the senses as primary forms of evidence for understanding religions.