
Duke Environmental Leadership Master of Environmental Management (DEL-MEM) Program

OVERVIEW

The Duke Environmental Leadership Master of Environmental Management (DEL-MEM) Program is a two-year, 30-credit program designed for mid-career environmental and business executives with a minimum of five years experience. The DEL-MEM curriculum, taught through a combination of on campus and online work, focuses on interdisciplinary and global themes, strategic approaches to environmental management, communication and effective leadership.

GENERAL PROGRESS REPORT

Listed below is a summary of our major activities.

Curriculum

- Finalized degree requirements and associated credits
 - Orientation course at the Duke campus 1 credit
 - Core modules 12 credits
 - Ecosystems Science and Management
 - Economics of Environmental Management
 - Environmental Policy and Law
 - Program Management for Environmental Professionals
 - Focused modules developed around more specialized themes 12 credits
 - Landscape Issues in Environmental Management
 - Environmental Decision Analysis
 - Land Use Policy
 - Environmental Information System Design and Management
 - Ecosystem and Human Health (planned for 2005/6)
 - Business and the Environment (planned for 2005/6)
 - Others TBD
 - Environmental leadership module, involving prominent leaders from the private, public and not-for-profit sectors in Washington, DC 1 credit
 - Masters project directly related to the student's current employment 4 credits

TOTAL 30 credits

- Determined 2004-2005 schedule and semester template

The two-year program includes four semesters. A typical course load is two courses per semester, and a sample semester is listed below.

Sample Semester:

Pre-reading period	3 weeks	
Place-based session	1 week	Program orientation, and course introductions
Break	1 week	
Distance learning	12 weeks*	
Break	2 weeks	
Reading week	1 week	
Place-based session	1 week	Course wrap-up, and new course introductions

*There will be a 1-week break halfway through the distance learning session.

Course Design and Development

- Drafted DEL course model

Based upon our discussions, CIT drafted a DEL course model that provides guidance for technologies/resources used in courses, and content and organization of courses. See appendix.

- Worked with DEL faculty advisory committee to begin course development
The six participating faculty members are in the process of developing the following courses: Norm Christensen, Ecosystems Science and Management*; Randy Kramer, Economics of Environmental Management*; Lynn Maguire, Environmental Decision Analysis; Bob Healy, Land Use Policy; Pat Halpin, Environmental Information System Design and Management; and Dean Urban, Landscape Issues in Environmental Management. For full course descriptions, see appendix.
**To be offered in fall 2004.*
- Drafted tentative schedule for 1-credit orientation course
Norm Christensen will lead a 1-credit, field-focused orientation course that will visit local sites for one day, and travel to the Duke University Marine Lab to visit various areas in the coastal region of the state.

Program Planning and Policy

- Received official approval of program at school and university level
In May 2003, the Nicholas School Education Committee endorsed the DEL-MEM program. In February 2004, the Duke University Academic Priorities Committee approved the program as well.
- Developed program outcomes
Upon completion of this program, the student will...
 - GAIN a unique interdisciplinary perspective of environmental issues, through the broad study of biological, physical and social sciences.
 - ASSESS and ENHANCE their leadership skills, building confidence in critical and creative thinking, communication, collaboration, and conflict resolution.
 - DEVELOP strong quantitative skills to better understand, interpret and manage environmental data.
 - EXPAND their understanding of information technology, including developing, maintaining and sharing high-quality information.
 - EXPLORE, in depth, an area of the environment that is directly related to their current employment or future direction.
 - LEARN and APPLY strategic approaches to environmental management.
 - EXAMINE the environment through both a local and global lens, and across spatial and temporal scales.

Application Process, Recruitment and Enrollment

- Completed online application
The electronic application, supported by ApplyYourself, can be found at www.nicholas.duke.edu/del/del-mem/prospective/application.html.
- Determined application/admissions timeline
 - Candidates are requested to apply online by March 1. Applications may be accepted after the final deadline on a space-available basis.
 - By mid-March, DEL Staff review the applications and compile summaries of the applicants, including a recommendation for admission.
 - DEL Faculty review applications, and provide final admissions decision by late March/early April.
 - Applicants notified of acceptance status by mid-April.
 - Applicants must return enrollment form and deposit by May 15 to secure spot in class.
- Drafted admissions criteria
The admissions committee considers the following in the selection process:

- Five years of relevant work experience
- Evidence of leadership potential and an established background in fields directly related to the environment, as shown by applicant essays and reference letters
- Self-motivation and commitment to learn at a distance
- A working knowledge of personal computers for word processing and data analysis
- An undergraduate degree from an accredited four-year college or university
- Written sponsorship from employer
- Proficiency in English
- Confirmed application requirements
A complete application includes:
 - Application form
 - Official GRE scores
 - Three letters of recommendation
 - Sponsor letter written on company letterhead stating that employer endorses participation in the program, and will grant the necessary time off to attend classes
 - Completed essay questions
 - Official, confidential transcripts from all colleges and universities previously attended, including official English translations if the original is not in English
 - Official TOEFL scores for applicants whose first language is not English
 - Non-refundable application fee of \$65 if submitted prior to March 1, \$75 after March 1
- Held two recruiting sessions in Washington, DC (December 2003) and Durham, NC (January 2004)
For the DC session, we had approximately 10 participants, and over 20 in NC.
- Received 8 completed applications
- Matriculated first class of 6 students (possibly 1-2 more)
As of May 2004, six students have officially decided to matriculate in the program. We have 1-2 outstanding applications that we expect to come in before the August start date. Although the class is small, they are very diverse geographically and professionally.

Marketing/PR

- Created “look and feel” for program and printed post card, brochure and application packet
Postcards and brochures mailed to 15,000+ people, and applications sent to over 250 people, who specifically inquired about the program.
- Created DEL website
Located at www.nicholas.duke.edu, the website provides (1) an overview of the program, (2) information for prospective students on admissions, financial aid, tuition and fees, technical requirements, and program objectives, (3) program format, degree requirements and course descriptions, (4) distance education information, such as links to Blackboard.com and other helpful sites, and techniques for successful online learning, including self-assessments to determine if DE is appropriate for the student.
- Advertised in a number of publications
Advertising included an article in the Spring 2003 Dukenvironment issue, an ad in United Airlines Hemispheres magazine (September 2003), a “highlight” in the Greening of Industry email newsletter (December 2003 and February 2004), an ad in the sustainablebusiness.com newsletter, and an article on their website (January 2004), and ads in the National Wildlife magazine (February/March 2004), and Rainforest Alliance 14th Annual Gala Journal (May 2004). In addition, ads are scheduled to run in green@work magazine in the May/June and July/August issues.
- Advertised on websites
Banner ads were placed on nationalgeographic.com and nytimes.com Science Times page (November 2003). Program descriptions were also posted on the following graduate school

program websites—petersons.com, gradschools.com, and enviroeducation.com, all of which have generated regular inquiries for application materials.

LESSONS LEARNED

The list below summarizes some of the lessons learned by the faculty and staff of the DEL-MEM program.

- Incorporating DE principles and technologies can enhance on-campus courses by increasing student interaction and participation, improving student technical skills, and increasing access to course materials.
- Information expands substantially in a distance learning course, so a typical semester-long, face-to-face course needs to be reduced by at least a third to fit into an online environment.
- “Tracking” students, which is done almost unconsciously in the classroom, is a very active process in courses taught at a distance.
- Faculty need to be aware of the “digital attention span” of students, and as a result, package information into manageable pieces, and present that information in such a way that the integration of the pieces is seamless.
- There are almost unlimited technologies available, however the best approach is to start simple. Fancier technology is not necessarily better.
- The 5P approach (preparation, presentation, participation, practice, performance assessment) is a very useful tool for course planning.
- Designing an online course requires a much different approach than designing a f2f course; and online teaching requires a different set of skills on the part of instructors.
- Creating an effective course requires constant attention to student engagement, feedback and assessment.
- It is important to focus on learner expectations in course development within the context of a different mode of course delivery. It's too easy to get sucked into worrying about how to deliver something rather than what to deliver.
- A strong online program must have exceptional faculty and strong support staff.
- Flexibility is a critical component to consider when delivering courses online, as many students are working adults with busy professional, family and social lives.
- Course and overall program evaluations are necessary for continuous improvement. Courses should be evaluated and revised after each offering.
- Community is the key word. To make students feel a part of the program, it's important to emphasize student-student and student-faculty interactions through conference calls, chat sessions, and moderated discussion boards, and provide students with the same support services as on-campus students.
- Multiple choice questions can be used to test for quite sophisticated reasoning skills.
- Simple technology can enhance online learning without requiring extensive training of instructors.
- Provide a variety of learning media to maintain student interest (i.e. written or recorded lectures, PowerPoint presentations (narrated and not), visual aids, etc.).
- Providing a course pack in hard copy, on CD, and online may help to accommodate various students' preferences.
- A lot of literature exists on DE best practice, so take advantage of existing knowledge by reading and talking to experienced staff and faculty at well-established online programs.
- If there is something you want to accomplish through technology to teach online, ask CIT, they probably know how to do it!

FINAL FELLOWS REQUIREMENTS

In general, we required that each faculty member provide a framework for their course, including a course plan and timeline. The scheduling of the course dictated whether they covered the entire course or a

portion thereof. For each module, we asked that they include learning objectives, component design information (5 P's—preparation, presentation, participation, practice, performance assessment), evaluation method, and deadline for completion for each module.

All six faculty members have fulfilled the necessary requirements to our satisfaction—Norm Christensen, Pat Halpin, Bob Healy, Randy Kramer, Lynn Maguire, and Dean Urban.

FUTURE GOALS AND TIMELINE

Summer 2004

- Create course development timeline
We will create a course development timeline for each set of courses to be taught in fall 2004, spring 2005, fall 2005, and spring 2006.
- Add current students section to the DEL website
We plan to add a current students section that includes a welcome page, calendar, and links to, or information about, academic advising, student policies, library resources, technical support, and Blackboard. We are also discussing a portal to the program, and the most appropriate means for posting general program information/announcements.
- Revisit program mission and vision
We plan to write a mission and vision statement for the DEL Program as a whole, which includes short courses, certificates, and the DEL-MEM degree program.
- Approve and number courses
This summer, we will have the Nicholas School Education Committee approve the courses to be taught in the fall of 2004, number them, and add to the ACES system.
- Determine IT needs and support
We will work with the Nicholas School IT department to determine a plan and timeline for all IT issues, including the laptop leasing program, IT orientation, and student support.
- Develop orientation and leadership module
We will work with the core faculty group to develop the orientation session, including a program overview and a one-credit course. We will also begin discussions with Don Wells, Director of the Duke Nonprofit Management Certificate Program, about the leadership module and how best to thread the concept throughout the two-year program.

Fall 2004

- Finalize 2005-2006 schedule
We have completed the scheduling for the first year of the program, but need to finalize dates for the place-based sessions in year two.
- Market program
We plan to continue to market aggressively to individuals, employers, and international audiences. We will focus on personal visits.
- Continue to develop courses
Throughout the year, we plan to continue to develop core modules, and recruit faculty for focused modules and electives.

2005-2006

- Accreditation
We plan to accredit the DEL-MEM program in year two or three through the Commission on Colleges—Southern Association of Colleges and Schools.

APPENDIX

- I. DEL Course Model
- II. Course Descriptions

I. DEL Course Model – Draft

Technologies/resources used in courses:

1. All courses will use Blackboard as their central web presence.
2. All courses will have access to telephone conferencing services (details and costs for this that can be supported by the program will be determined by the program administration; CIT recommends at least some number of hours of conferencing be provided gratis to students)
3. All courses will have access to Duke's streaming media server and can develop and provide such media to students if desired. Faculty are encouraged to use these media where appropriate to support course goals, in portions not longer than 20 minutes. Where appropriate, media used in courses can be packaged on CD-ROM for mailing to students prior to class.
4. All courses will use Perkins e-reserves process to create and make available course readings that aren't provided by text, CD-ROM or online.
5. All courses will prepare all documents longer than 4 pages as a course pack, CD-ROM or text book, to reduce the printing and downloading burden on students.
6. All students in all courses will be able to fully access Duke library resources (either in person or electronically).
7. Students may be required to submit assignments by Blackboard (digital dropbox, for example), email, postal mail, or FAX.
8. All courses will enter scheduled assignments in the course calendar, so that students can use the Bb calendar function to view a compiled list of these for the program.

Content and organization of courses:

1. Course Information section
 - a. Syllabus of entire course (before first day of the class)
 - b. Course policies (including participation, grading, access to resources, etc.)
 - c. Course learning objectives (posted outside of syllabus)
 - d. Course schedule (posted outside of syllabus, entered in Bb calendar)
 - e. Course assignments overview (posted outside of syllabus)
 - f. Link to program web page with program location and contact info
2. Faculty Information
 - a. Name, telephone number, email address, office location, full mailing address, FAX number, online or f2f office hours times/days
 - b. Contact preferences (days of the week and times of the day, modality) and expected communication patterns (particularly days when no communication should be expected).
 - c. Image/photo
 - d. Link to video/audio introduction (optional)
3. Course Materials (standard unit/module format; should be organized in one folder/unit)
 - a. Abstract/description/overview of unit; this segment should set the context for the unit, recall prior related knowledge, pose thought-provoking questions, etc.
 - b. Learning objectives for unit
 - c. Readings and other resources required for unit (list)
 - d. "Presentation" by faculty member for that unit (this could include text posted in Blackboard, animated PPT presentation, audio/video segment, etc.). CIT recommends using varied modalities both within and between units, to match different learning styles and hold student interest.

- e. Activities, including discussion between the students (electronic or telephone, as appropriate) and/or work on group projects. When discussions are used, summaries of discussions could be compiled and posted by students.
 - f. Assessments/assignments related to that unit's objectives (students should be able to identify objectives served by any assessment).
4. Communications (keep all tools available)
 - a. Standard communication mechanism will be Blackboard discussion board.
 - b. Courses should include a social (non-academic) discussion area (café, water cooler, or similar). Courses may include a "housekeeping" or course administration forum, and/or a private student forum (no instructor access).
 - c. Alternate communication tools include email, virtual chat, telephone conferencing, and fax.
 5. Tools (keep at least Manual, Drop Box, Check my Grade, Edit My Homepage, Calendar available)
 - a. ask students to create homepages to display in roster list, to build community.
 6. Gradebook: all courses will use the Blackboard gradebook, whether using Blackboard online assessments (quizzes, surveys) or not.
 7. External links section: Unless instructors choose to create a full electronic resource list in this section, CIT recommends that online resources needed for course units be linked where relevant inside those units, rather than being listed out-of-context in an External Links section.
 8. Course design: all courses will use similar Blackboard button styles and banner graphics, any video segments will be edited including similar visual elements (titling, etc.)

II. Course Descriptions

Core Modules

Ecosystems Science and Management

Environmental management must be accomplished in the context of arbitrary temporal and spatial boundaries, complexity, dynamic processes, uncertainty, and varied and changing human values. Topics in this course will include adaptive management, decision making in the context of uncertainty, conflict resolution, strategic planning, evaluation and accountability. Case studies will cover terrestrial, aquatic and marine ecosystems and an array of social and institutional settings.

Economics of Environmental Management

This course will provide an economic perspective on the management of environmental resources. Conceptual topics to be emphasized include environmental externalities, market failure, public goods, sustainability, and benefit-cost analysis. The course will emphasize the use of economics in understanding and solving environmental problems. Case studies will include carbon trading to address climate change and the use of economic incentives for biodiversity conservation.

Environmental Policy and Law

This course develops a policy analysis framework for studying resource and environmental policy. In addition, it will survey broadly the field of environmental law by way of case studies at the state, national and international level with particular emphasis on process and trends. Specific topics will include political institutions, interest group theory, public choice theory, economics in policy analysis, ethics and values.

Program Management for Environmental Professionals

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.

Focused Modules

Landscape Issues in Environmental Management

Environmental management is pursued at increasingly larger spatial scales. As a direct consequence, we encounter more spatial heterogeneity and logistical constraints on empirical approaches. The field of landscape ecology specifically addresses issues of spatial scale and heterogeneity as these influence our ecological understanding and management of natural and seminatural systems. This course is an applications-driven survey of common tasks in landscape management, including inventory and monitoring programs and prioritizing sites according to various criteria (e.g., diversity hotspots, environmental impacts). Specific applications emphasize ecosystem processes (productivity, hydrology) and conservation planning at large scales. To address the uncertainty that naturally attends these applications, the course is developed in the framework of adaptive management.

Environmental Decision Analysis

In environmental management, things don't always turn out as you expect. You must address multiple goals, even when those goals themselves conflict. You must respond to diverse stakeholders, who may see the world differently. The tools of decision analysis will help you organize and analyze difficult environmental management decisions, so that you can do a better job than you could with unaided intuition. This course will cover quantitative methods for analyzing environmental problems involving uncertainty and multiple, conflicting objectives. Topics include subjective probability, utility, value of information, and multiattribute methods. Students will apply these tools to an environmental policy decision in a group or individual project.

Land Use Policy

This course covers the economic and demographic forces that drive the allocation of land among alternative uses, and the institutional structure that has evolved in the U.S. at local, state and federal levels to deal with land use problems. Topics include food and timber supply, federal lands, sprawl, industrial siting, property rights, and coastal zone management.

Environmental Information System Design and Management

Developing, maintaining and sharing high-quality information is one of the fastest growing challenges in the field of environmental management. Environmental researchers and managers are both the developers and consumers of extensive geographic data, imagery and statistical archives. Environmental managers now must meet expectations of real-time data sharing across widely distributed projects within detailed data assurance standards. In order to meet these challenges, environmental managers need to understand the design of complex relational databases, the implementation of internet based data delivery systems, and the maintenance of international metadata standards. This course will focus on essential issues of database development, delivery and maintenance for environmental managers. The course will highlight new developments in digital data archives, internet map servers and collaborative programs, and use emerging projects, protocols and current case studies to illustrate management choices, strategies and evaluation processes.

Additional courses on the topics of Ecosystem and Human Health and Business and the Environment are planned and may be available in 2005/6.