

University of North Carolina at Charlotte

New Doctoral Graduate Courses

Course and Curriculum Proposal from: Infrastructure and Environmental Systems (INES)

Title: New courses for the Infrastructure and Environmental Systems PhD Program

II.A. Proposal Summary and Catalog Copy

1. Summary. The Infrastructure and Environmental Systems PhD Program proposes to add four courses: INES 8101, INES 8102, INES 8110, and INES 8690 in support of the INES PhD Program.
2. Proposed Catalog Copy.

INES 8101 Environmental Systems (3). Prerequisite: Admission into the INES PhD program. This course examines the principles of energy and mass transport as applied to the atmosphere, hydrosphere, lithosphere and the Earth's biogeochemical systems and how these impact human activities and infrastructure. Emerging environmental issues and technologies in the areas of environmental impact due to human activities and natural disasters, and environmental sustainability including industrial ecology, waste minimization and recycling, will also be examined. (*Fall or Spring*).

INES 8102 Infrastructure Systems (3). Prerequisite: Admission into the INES PhD program. Overview of urban infrastructural development. Sustainable design features for facilities including municipal, transit, industrial, agricultural, telecommunications, and waste management. Impact of infrastructure development on environmental management including storm water quality and quantity, soil and channel erosion, urban air quality, sprawl, and waste production, treatment, and storage. (*Fall or Spring*).

INES 8110 Acquisition and Management of Scientific Data (3). Prerequisite: Admission into the INES PhD program. The study of theories and techniques for acquiring and managing scientific data and information related to the analysis, design, and management of the infrastructure and the environment. Includes pertinent aspects of information technology, such as data mining and data architecture, and includes applications of GIS and non-destructive assessment technologies to data acquisition. (*Fall or Spring*).

INES 8690 Seminar (1). Prerequisite: Admission into the INES PhD program. Each student will be required to actively participate in program seminars delivered by student researchers, faculty and invited speakers. These seminars will be advertised to the campus and professional communities. Participation in these seminars will count for a total of 3 credits (1 credit for each semester). Prior to graduation, each student will make at least one seminar presentation and provide at least one formal critique of a presentation in this course. Can be repeated for credit. (*Fall and/or Spring*).

II. B. Justification

1. The four courses proposed here focus on basic and advanced level understanding of the principles of infrastructure design and environmental analysis. These courses emphasize environmental analysis and assessment, the effects of the environment on the infrastructure, the design of the infrastructure, and the impact of infrastructure on the environment. These courses were listed in the permission-to-establish document for the INES program which was approved by the UNC Board of Governors for an August 2004 start date.

INES PhD students participate in interdisciplinary activities throughout their program of study. All students begin with a pair of interdisciplinary core courses (INES 8101 and INES 8102) that introduce fundamental aspects of the infrastructure and the environmental systems present in all applications of INES. Students then choose from one of three additional core courses to strengthen expertise in their area of study. In this proposal we include INES 8110 Acquisition and Management of Scientific Data as one of those three choices. Throughout their program of study, all students participate in an interdisciplinary seminar course (INES 8690).

2. Prerequisites for the four courses proposed here (INES 8101, 8102, 8110 and 8690) are admission to the INES PhD.
3. Course Numbering. The courses are placed at the 8000 level because they are intended for PhD graduate students, and also because the level of the material and the expectation for student performance are consistent with a PhD program.

II. C. Impact

These courses are developed for the graduate students enrolled in the Infrastructure and Environmental Systems PhD program. Anticipated enrollment in these courses is 5 to 15 students. The program began in the fall semester of

2004 at which time 12 students were enrolled in the first offering of the Infrastructure Systems core course and the seminar course.

II. D. Resources Required to Support the Proposal

1. Personnel: Participating faculty are primarily in the Department of Civil Engineering and the Department of Geography and Earth Sciences. Additional faculty may be found in the Departments of Biology and Chemistry in the College of Arts and Sciences, the program of Engineering Management in the College of Engineering, the College of Architecture, and the Department of Economics in the College of Business Administration.
2. Physical Facility: No new facilities are required.
3. Equipment and Supplies: No new equipment or supplies will be needed.
4. Computer Software: No new software
5. Audio-Visual: None required
6. Other resources: None required

II. E. Consultation with Library and Other Departments and Units

1. Library Consultation. The proposed courses were reviewed by Anne Osterman and approved on October 14, 2004. See attached letters. Original signed letters are on file.
2. See attached letters from Department of Civil Engineering, Department of Geography and Earth Sciences, Department of Biology, Engineering Management Program, Public Policy

II. F. Initiation and Consideration of Proposal.

1. Originating Unit. Infrastructure and Environmental Systems Program, 10/10/04

II. G. Attachments

1. Course syllabi
2. Consultation on library holdings
3. Support letters from other departments and programs.

INES 8101 – ENVIRONMENTAL SYSTEMS

(T, R) 4:00 – 5:20 pm, Smith 260

INES 8101 Environmental Systems (3). Prerequisite: admission to the INES PhD program. This course examines the principles of energy and mass transport as applied to the atmosphere, hydrosphere, lithosphere and the Earth's biogeochemical systems and how these impact human activities and infrastructure. Emerging environmental issues and technologies in the areas of environmental impact due to human activities and natural disasters, and environmental sustainability including industrial ecology, waste minimization and recycling, will also be examined. (*Fall or Spring*).

INSTRUCTORS:Dr. Craig Allan, McEniry 408, 704-687-3377, cjallan@uncc.eduDr. Jy Wu Kennedy 310, 704-687-4178, jwu@uncc.edu**TEXT:**

- Handouts

OFFICE HOURS:

- Dr. Allan
 - 2:00pm – 4:00pm T, R
- Dr. Wu
 - 2:00pm – 3:30pm M, W

PREREQUISITE:

- Acceptance into the INES Ph.D. program.

OBJECTIVES:

This PhD level class is one of the two required introductory core courses in the Infrastructure and Environmental Systems PhD interdisciplinary program. The class will examine the details of the Earth's energy and material cycles and how human activities are impacting them at the global and local scale. Strategies to reduce impact of human activities on natural systems will be discussed. Lectures by the instructors, as well as lectures by guest lecturers from academia, the private sector and the public sector, will cover both theoretical frameworks and applied aspects of the various topics examined in this course.

STUDENT CONDUCT:

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (latest revision). This code forbids cheating, fabrication, or falsification of information, multiple submission of academic work,

plagiarism, abuse of academic materials, and complicity in academic dishonesty. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to “U”. Copies of the code can be obtained from the Dean of Students Office. UNC Charlotte policy is that ALL instances of suspected cheating be handled according to The UNC Charlotte Code of Student Academic Integrity (latest revision).

ATTENDANCE:

Students are expected to attend all classes and to arrive punctually. Any absence that is predictable should be discussed with the course instructors in advance.

PROGRESS REPORTS AND FINAL REPORT:

Every student will work as part of a small team. Each team will be responsible for preparing a project proposal, one progress report and a final report during the semester. Members of the team will be evaluated based on both the group’s and the individual member’s performance. The progress reports and the final report will be made both orally and in writing. Written reports not submitted on time and in proper format will not be accepted without a valid excuse.

PRESENTATIONS:

As noted above, every student will be participating in three presentations during the semester. A grade of zero will be given to any student who misses any presentation unless a valid excuse is presented promptly in writing.

COURSE GRADING:

Course Grade: (A=90-100, B=80-89, C=65-79, U=<65). Grades can be roughly estimated from the following:

Research Proposal Presentation and Report.....	20%
Progress Presentation and Report.....	10%
Final Presentation and Report.....	40%
Précis and Critique.....	20%
Class Participation	10%

ADDITIONAL COURSE REQUIREMENTS:

- Throughout the semester, guest speakers will present both theoretical and applied presentations of the topics to be covered in this course. Your attendance and undivided attention are required. You will be required to either Précis or critique each presentation.
- All presentations and reports are required to be professional in appearance and all external sources are to be properly cited and referenced.

TENTATIVE CLASS SCHEDULE:

<u>Week</u>	<u>DATE</u>	<u>TOPIC</u>
1	January 13	Class Overview
2	January 18, 20	Global Environmental Cycles
3	January 25, 27	The Urban Energy Balance
4	February 1, 3	The Urban Atmosphere
5	February 8, 10	Green Building Design
6	February 15, 17	Project Proposals
7	February 22, 24	Urban Hydrology
8	March 1, 3	Urban Water Quality
9	March 15, 17	Natural Channel Design and Stormwater BMP's
10	March 22, 24	Project Progress Reports
11	March 29, 31	Transportation Infrastructure and Environmental Considerations.
12	April 5, 7	Energy Supply and Utilization
13	April 12, 14	Human Impacts and the Global Climate System
14	April 19, 21	Industrial Ecology
15	April 26, 28	Infrastructure and Sustainability
16	May 3	Natural Disasters
FINAL	May 7	7:00-10:00 p.m. (Final Presentations)

INES 8102 – INFRASTRUCTURE SYSTEMS

(W) 5:30 – 8:20 pm, Smith 260

Catalog Copy: INES 8102 Infrastructure Systems (3). Prerequisite: admission into the INES PhD program. Overview of urban infrastructural development. Sustainable design features for facilities including municipal, transit, industrial, agricultural, telecommunications, and waste management. Impact of infrastructure development on environmental management including storm water quality and quantity, soil and channel erosion, urban air quality, sprawl, and waste production, treatment, and storage. (*Fall or Spring*).

INSTRUCTORS:Dr. Janos Gergely, Smith 212, 704-687-4166, jgergely@uncc.eduDr. John Diemer, McEniry 440, 704-687-4254, jadiemer@email.uncc.edu**TEXT:** Handouts**OFFICE HOURS:**

- Dr. Gergely
 - 4:00pm – 5:25pm W, R
- Dr. Diemer
 - 2:00pm – 3:30pm M, W

PREREQUISITE: Acceptance into the INES PhD program.**OBJECTIVES:**

This PhD level class is one of the two required introductory core courses in the Infrastructure and Environmental Systems PhD interdisciplinary program. The class will offer an overview of infrastructural development, with emphasis on sustainable design features, for such infrastructure as municipal, transportation, industrial, agricultural, telecommunication, and waste management facilities. Furthermore, this class will investigate the impact of infrastructure development on environmental systems including the atmosphere, biosphere, hydrosphere and lithosphere. Topics could include impacts on air quality, ecology, erosion, sedimentation, water quality, and water quantity. The course will develop teamwork skills as much of the work will be done in small groups. Communication skills will be enhanced by both oral and written reports.

STUDENT CONDUCT:

Students have the responsibility to know and observe the requirements of The UNCC Code of Student Academic Integrity (latest revision). This code forbids cheating, fabrication, or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty.

Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to “U”. Copies of the code can be obtained from the Dean of Students Office. UNC Charlotte policy is that ALL instances of suspected cheating be handled according to The UNC Charlotte Code of Student Academic Integrity (latest revision).

ATTENDANCE:

Students are expected to attend all classes and to arrive punctually; failure to do so will result in a lower class participation grade. Any absence that is predictable should be discussed with the course instructor in advance.

PROGRESS REPORTS AND FINAL REPORT:

Every student will work as part of a small team. Each team will be responsible for preparing two progress reports and a final report during the semester. Members of the team will be evaluated based on both the group’s and the individual member’s performance. The progress reports and the final report will be made both orally and in writing. The written reports are due at the start of class on the due date! Written reports not submitted on time and in proper format will not be accepted without a valid excuse.

PRESENTATIONS:

As noted above, every student will be making three presentations during the semester. A grade of zero will be given to any student who misses any presentation unless a valid excuse is presented promptly in writing.

COURSE GRADING:

Course Grade: (A=90-100, B=80-89, C=65-79, U=<65). Grades can be roughly estimated from the following:

2 Progress Presentations (2 x 5%).....	10%
2 Progress Reports (2 x 15%).....	30%
Final Presentation	10%
Final Report	35%
Quizzes	5%
Class Participation	10%

ADDITIONAL COURSE REQUIREMENTS:

- Throughout the semester, guest speakers will be invited to discuss several important topics. Your attendance and undivided attention are required. Quizzes based on the presentations will be administered.
- Your written/typed work must be **neatly presented** and easily followed. Individual contributions to group reports must be clearly identified. All reports must be typed.
- Your presentations will reflect the effort of a Ph.D. student! After all, communication skills will be essential in your future careers!
- When a textbook, engineering code, or published article is utilized to obtain any data, it must be appropriately **referenced** as described in class.
- Turn off cell phones!

TENTATIVE CLASS SCHEDULE:

<u>LECTURE</u>	<u>DATE</u>	<u>TOPIC</u>
1	8/25	Class Overview, Design-Build
2	9/1	Permitting, LEEDS Program
3	9/8	Planning, Conceptual Design and Ecological Impact
4	9/15	Geologic History of the Site
5	9/22	Natural Disaster Considerations
6	9/29	Progress Presentations (Progress Report I)
7	10/6	Sustainable Design
8	10/13	Material Selection
9	10/20	Environmental Considerations
10	10/27	Vulnerability Reduction, Risk Management
11	11/3	Progress Presentations (Progress Report II)
12	11/10	Durability and Maintenance
13	11/17	Life Cycle Issues
14	12/1	Repair/Retrofit Methods
15	12/8	Final Report Due Date, Discussions
FINAL	12/15	7:00-10:00 p.m. (Final Presentations)

Syllabus: INES 8110: Acquisition and Management of Scientific Data

Instructor: Mark J. Thomasson – Geography and Earth Sciences
(with assistance from Jim Bowen – Civil Engineering)
Course: INES 8110: Acquisition and Management of Scientific Data
Text: TBD
Class meets: T-Th: 8:00 – 9:20 am
Office hours: Thomasson: Tuesday 11:00 am-12:00 pm; other times by appointment
Office / Phone: Thomasson: McEniry 404 / (704) 687-4256
Bowen: CARC 243 / (704) 687-3130

Course Description: INES 8110 Acquisition and Management of Scientific Data (3). Prerequisite: Admission into the INES PhD program. The study of theories and techniques for acquiring and managing scientific data and information related to the analysis, design, and management of the infrastructure and the environment. Includes pertinent aspects of information technology, such as data mining and data architecture, and includes applications of GIS and non-destructive assessment technologies to data acquisition. (*Fall or Spring*).

Pre-/Co-requisites: Admission into the INES PhD program. Also, Calculus I/II and a Programming language.

Objectives of the course:

1. Provide sources of information for infrastructure and environmental systems research
2. Introduce the concept of data mining, *the extraction of hidden predictive information from large databases*
3. Examine methods for data mining: an analytic process designed to explore data (usually large amounts of data) in search of consistent patterns and/or systematic relationships between variables, and then to validate the findings by applying the detected patterns to new subsets of data.
4. Examine exploratory data analysis: identify systematic relations between variables.
5. Examine software tools for analysis: overview about the functionality, the availability for different operating systems and the speed of mathematical programs for analyzing large data sets in mathematical, statistical or graphical ways.

Instructional Method: Lectures will consist of the introduction, definition and analysis of specific topics related to the objectives of the course followed by specific examples. This course uses computers intensively.

Grading/evaluation structure: Students will develop and present three projects related to specific topics in the course. Students will also be evaluated based on class participation on specific topics assigned.

Project I:	25 %
Project II:	25 %
Project III:	25 %
<u>Participation:</u>	<u>25 %</u>
Total:	100 %

Student Conduct:

Class attendance is required. More than 4 absences in a semester will result in an automatic U (failure) for the course. Students are expected to be on time for class. No cell phones, beepers, etc. should be turned on in class. Grading structure: A (100-90); B (89-80); C (79-65); U (< 70).

Students are expected to follow the guidelines for student responsibility and conduct as described in the UNC Charlotte Code of Student Responsibility. Students are responsible for all information presented during class time, labs and readings. Attendance in class is expected as topics of discussion may change from the outline. Students should note also that there is a high correlation between class attendance

and good grades in this class. In addition, as this is a large class, students are expected to maintain a basic courtesy to the instructor and to other students. Unacceptable behavior: sleeping, conversations with other students during lecture, entering and leaving the class during lecture. If students have a prior appointment during the lecture time they should inform the instructor **BEFORE** the start of class. If the student needs to be excused then that person should raise their hand and ask to be excused.

Academic Integrity Maintaining academic integrity is a shared responsibility of the faculty and students. Faculty should familiarize themselves with Policy Statement #105, the UNC Charlotte "Code of Student Academic Integrity" (the Code), which describes in detail the various behaviors that constitute violations of academic integrity and the procedures faculty must follow in handling cases of violations and penalties. The Code is available at all times in pamphlet form from the Office of the Dean of Students and can be found at www.uncc.edu/unccatty/policystate/ps-105.html. Violations of the Code include, but are not limited to, plagiarism, use of unauthorized notes during a test or examination, and other incidents that reflect unethical and/or dishonest academic behavior. Students may not present as their own the ideas, opinions, images, figures, language or concepts of another, including those of other students. Sources must be properly and fully acknowledged. Also, if a student has received any kind of help (except that permitted by the instructor) in the preparation of a project, that help must be fully acknowledged. Papers and other materials bought from "term paper writing services," if submitted as the work of anyone except the writing service, are illegal under North Carolina statute.

All UNC Charlotte students have the responsibility to be familiar with and to observe the requirements of The UNC Charlotte Code of Student Academic Integrity (see the Catalog). This Code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials (such as Library books on reserve), and complicity in academic dishonesty (helping others to violate the Code). Any further specific requirements or permission regarding academic integrity in this course will be stated by the instructor, and are also binding on the students in this course. Students who violate the Code can be punished to the extent of being permanently expelled from UNC Charlotte and having this fact recorded on their official transcripts. The normal penalty is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to "F." If you do not have a copy of the Code, you can obtain one from the Dean of Students Office or access it online at www.uncc.edu/unccatty/policystate/ps-105.html. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty they become aware of to the course instructor who is responsible for dealing with them.

Probable textbooks or resources:

Computer Vision and Fuzzy-Neural Systems
Arun D. Kulkarni, University of Texas

Applied Numerical Methods for Engineers and Scientists
Singiresu S. Rao, University of Miami

Data Mining: Introductory and Advanced Topics
Margaret H. Dunham

Spatial Databases: A Tour
Shashi Shekhar and Sanjay Chawla, University of Minnesota

Graphical Models: Methods for Data Analysis and Mining
Christian Borgelt, Rudolf Kruse; ISBN: 0-470-84337-3

Neural Networks for Pattern Recognition
Christopher M. Bishop

Topics:

1. Sources of information for infrastructure and environmental systems research
2. Data mining
3. Methods for data mining
 - a. Case study
 - b. Project – definition of problem, data mining, analysis of data mining process
4. Exploratory data analysis
5. Data analysis software
 - a. Case study
 - b. Project – Defining problem, extracting data, analysis of data

INES 8690 Seminar

INES 8690 Seminar (1). Prerequisite: Admission into the INES PhD program. Each student will be required to actively participate in program seminars delivered by student researchers, faculty and invited speakers. These seminars will be advertised to the campus and professional communities. Participation in these seminars will count for a total of 3 credit hours (1 credit hour for each semester). Prior to graduation, each student will make at least one seminar presentation and provide at least one formal critique of a presentation in this course. Can be repeated for credit. (*Fall and/or Spring*).

Prerequisites: Admission into INES PhD Program.

INES 8690 - Seminar Fall, 2004

Educational Objectives: Throughout the program, INES students, regardless of focus areas, will come together in this interdisciplinary seminar course to make and critique presentations and participate in discussions on topics related to their respective focus areas. They will strengthen their appreciation of the inter-disciplinary nature of infrastructure and environmental systems and their impacts upon each other.

Course Description: Each student will be required to actively participate in program seminars delivered by student researchers, faculty and invited speakers. These seminars will be advertised to the campus and professional communities. Participation in these seminars will count for 3 credit hours (1 credit hour for each of 3 semesters). Students must enroll in a minimum of 3 semesters. Prior to graduation, each student will make at least one seminar presentation and provide at least one formal critique of a presentation in this course.

Textbook: None

References: Handouts may be given

Professor: Dr. David T. Young, Professor in CE and Chair
264 Smith Hall, Extension 4175
Office hours posted

Schedule: (T) 3:30 – 4:40 in McEniry 133

Topics: See "Class Schedule"

Grading: A, B, C, U (The grade will be based on attendance and participation.)

Homework and Tests: None

Papers: Each speaker will leave the class with an open-ended question requiring thought and deliberation. At the instructor's discretion, students may be asked to submit an opinion paper addressing that question. The paper should be at least one page (typed, double-spaced).

Papers are due within 2 weeks of the relevant presentation.

All students will honor the UNCC Code of Academic Integrity

INES Ph.D. Seminar Series
Tuesdays 3:30-4:50 pm; Fall, 2004

Date	Speaker	Topic	Location
August 24, 2004	-----	Class organization	133 McEniry
September 7, 2004	Dr. Helene Hilger Dept. of Civil Engineering at UNC Charlotte	Infrastructure and Environmental Sustainability	133 McEniry
September 21, 2004	Dr. David Young Dept. of Civil Engineering at UNC Charlotte	Hazards, Vulnerabilities, and Risks to the Infrastructure and the Environment	133 McEniry
October 5, 2004	Dr. Martha Epps Dept. of Geography & Earth Science at UNC Charlotte	Tectonic Geomorphology	133 McEniry
October 19, 2004	Dr. Edd Hauser Dept. of Geography & Earth Science at UNC Charlotte (Tentative)	Intelligent Transportation Systems	133 McEniry
November 2, 2004	Dr. John Daniels Dept. of Civil Engineering at UNC Charlotte	Management of Coal Combustion Facilities and the Impact on the Infrastructure and the Environment	133 McEniry
November 16, 2004	Dr. Craig Allan Dept. of Geography & Earth Science at UNC Charlotte	Use of Restored Buffers to Control Agricultural Non- Point Source Pollution	133 McEniry
November 30, 2004	Dr. Mark Thomasson Dept. of Geography & Earth Science at UNC Charlotte	Unsaturated Flow and Transport Characteristics	133 McEniry

LIBRARY CONSULTATIONS:

When consulting the library, INES 8101 and INES 8102 had provisional course titles (see letters from Anne Osterman dated October 14, 2004). After the library was consulted, the course titles were changed in order to make the course names more distinctive. The revised course names are as follows:

INES 8101 Environment and Infrastructure was changed to INES 8101 Environmental Systems.

INES 8102 Infrastructure and Environment was changed to INES 8102 Infrastructure Systems.

These changes in title do not affect the course number or the course content as reviewed by the library. We would like to use the original library consultation letters in this packet rather than requesting a second library consultation for the same course.



Consultation on Library Holdings

To: John Diemer, Infrastructure and Environmental Systems

From: Anne Osterman, Library

Date: October 14, 2004

Subject: INES 8101, Environment and Infrastructure

Check One:

- 1. Holdings are superior
- 2. Holdings are adequate _____ **X**
- 3. Holdings are adequate only if Dept. purchases additional items. _____
- 4. Holdings are inadequate _____

Comments:

Library holdings are adequate for the course, INES 8101, Environment and Infrastructure. Some areas of concern are environmental sciences and ecology journals and the currency of the print collection for the following subjects: atmosphere, atmospheric circulation, climatology, and waste management.

A review of journal titles listed in the 2003 Journal Citation Reports Social Sciences and Sciences editions under the following categories indicated adequate journal holdings. (Paper, microform, or electronic format counted as holdings for a title. Many of the titles had multiple routes of access.) An access assessment was done of the percentage of the total number of titles in a category, the percentage of titles owned that were in the top half ranked by total number of cites (year 2003), and the percentage of titles owned that were in the top half ranked by Impact Factor. (Impact Factor, according to JCR, is "a measure of the frequency with which the 'average article' in a journal has been cited in a particular year.")

JCR Category	Total number of Titles	% to which library has access	% of upper half when ranked by Total Cites to which Library has access	% of upper half when ranked by Impact Factor to which the library has access
Biodiversity Conservation	21	43%	30%	50%
Ecology	105	50%	37%	62%
Energy & Fuels	62	53%	45%	61%
Environmental Sciences	131	47%	35%	60%
Environmental Studies	50	70%	64%	76%
Geosciences,	128			

Multidisciplinary		52%	45%	58%
Planning and Development	39	64%	53%	74%
Urban Studies	28	71%	64%	79%
Water Resources	55	51%	41%	63%

The library provides access to a number of electronic indexes relevant to the topics of this course: Ecology Abstracts (1982-Current), Pollution Abstracts (1981-Current), Water Resources Abstracts (1967-Current), GeoRef (1785-Current), EIS: Digests of Environmental Impact Statements (1985-Current), Conference Papers Index (1982-Current), Aquatic Sciences and Fisheries Abstracts (1978-Current), Energy Citations Database (1948+), Environmental Engineering Abstracts (1990-Current), and GEOBASE. Other broader, but still relevant, indexes include Academic Search Elite, MasterFile Premier, InfoTrac OneFile, and ABI Inform. These general databases all contain a number of the titles used in the above journal analysis.

Although journal articles are the most effective way to support doctoral-level research, a solid, up-to-date monograph collection is also necessary. LC Subject Headings relevant to each of the courses were chosen, and, for each, the total number of titles in the library's collection is given, as is the number of titles published in the last five years.

LC Subject Heading	Number of Titles in Atkins Library	Number of Titles in Atkins Library published since 1999
Atmosphere	304	22
Atmospheric circulation	44	0
Biosphere	49	9
Climatology	219	11
Ecology	4183	763
Environmental management	127	64
Environmental monitoring	340	55
Environmental policy	1869	346
Geology	4032	426
Global environmental change	51	29
Hydrology	847	91
Industrial ecology	11	7
Infrastructure	296	83
Nature – Effect of human beings on	354	63
Waste management	148	17
Water balance	28	11

Evaluator's Signature _____

Date _____



Consultation on Library Holdings

To: John Diemer, Infrastructure and Environmental Systems

From: Anne Osterman, Library

Date: October 14, 2004

Subject: INES 8102, Infrastructure and Environment

Check One:

- 5. Holdings are superior _____
- 6. Holdings are adequate _____ **X** _____
- 7. Holdings are adequate only if Dept. purchases additional items. _____
- 8. Holdings are inadequate _____

Comments:

Library holdings are adequate for the course, INES 8102, Infrastructure and Environment. Some areas of concern are environmental sciences and ecology journals and the currency of the print collection for the following subjects: atmosphere, atmospheric circulation, communication and traffic, erosion, sustainable agriculture, telecommunications, waste management, and waste treatment.

A review of journal titles listed in the 2003 Journal Citation Reports Social Sciences and Sciences editions under the following categories indicated adequate journal holdings. (Paper, microform, or electronic format counted as holdings for a title. Many of the titles had multiple routes of access.) An access assessment was done of the percentage of the total number of titles in a category, the percentage of titles owned that were in the top half ranked by total number of cites (year 2003), and the percentage of titles owned that were in the top half ranked by Impact Factor. (Impact Factor, according to JCR, is "a measure of the frequency with which the 'average article' in a journal has been cited in a particular year.")

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Energy & Fuels	62	53%	45%	61%
Environmental Sciences	131	47%	35%	60%

Environmental Studies	50	70%	64%	76%
Geosciences, Multidisciplinary	128	52%	45%	58%
Planning and Development	39	64%	53%	74%
Urban Studies	28	71%	64%	79%
Water Resources	55	51%	41%	63%

The library provides access to a number of indexes relevant to the topics of this course: Ecology Abstracts (1982-Current), Pollution Abstracts (1981-Current), Water Resources Abstracts (1967-Current), GeoRef (1785-Current), EIS: Digests of Environmental Impact Statements (1985-Current), Conference Papers Index (1982-Current), Aquatic Sciences and Fisheries Abstracts (1978-Current), Energy Citations Database (1948+), Environmental Engineering Abstracts (1990-Current), and GEOBASE. Other broader, but still relevant, indexes include Academic Search Elite, MasterFile Premier, InfoTrac OneFile, and ABI Inform. These general databases all contain a number of the titles used in the above journal analysis.

Although journal articles are the most effective way to support doctoral-level research, a solid, up-to-date monograph collection is also necessary. LC Subject Headings relevant to each of the courses were chosen, and, for each, the total number of titles in the library's collection is given, as is the number of titles published in the last five years.

LC Subject Heading	Number of Titles in Atkins Library	Number of Titles in Atkins Library published since 1999
Air quality	749	130
Atmosphere	304	22
Biosphere	49	9
Cities and towns growth	137	18
Communication and traffic	50	8
Ecology	4183	763
Environmental management	127	64
Environmental monitoring	340	55
Environmental policy	1869	346
Erosion	252	25
Geology	4032	426
Hydrology	847	91
Industrial ecology	11	7
Infrastructure	296	83
Rural transportation	13	3
Sedimentation	265	33
Sustainable agriculture	65	22
Telecommunications	73	20
Transportation	4042	610
Urban transportation	584	42
Waste management	148	17
Waste treatment	89	6
Water balance	28	11

Water quality	2861	550
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Evaluator's Signature _____

Date _____



Consultation on Library Holdings

To: John Diemer, Infrastructure and Environmental Systems

From: Anne Osterman, Library

Date: October 14, 2004

Subject: INES 8110, Acquisition and Management of Scientific Data

Check One:

- 9. Holdings are superior _____
- 10. Holdings are adequate _____ **X**
- 11. Holdings are adequate only if Dept. purchases additional items. _____
- 12. Holdings are inadequate _____

Comments:

Library holdings are adequate for the course, INES 8110, Acquisition and Management of Scientific Data. Some areas of concern are environmental sciences journals, the currency of the print collection for the subjects of geography – statistical methods, geology – statistical methods, and spatial analysis (statistics), and both the total amount of print materials available and the currency of those materials for statistical methods in the following subject areas: earth sciences, environmental sciences, hydrology, population geography, and public health.

A review of journal titles listed in the 2003 Journal Citation Reports Social Sciences and Sciences editions under the following categories indicated adequate journal holdings. (Paper, microform, or electronic format counted as holdings for a title. Many of the titles had multiple routes of access.) An access assessment was done of the percentage of the total number of titles in a category, the percentage of titles owned that were in the top half ranked by total number of cites (year 2003), and the percentage of titles owned that were in the top half ranked by Impact Factor. (Impact Factor, according to JCR, is "a measure of the frequency with which the 'average article' in a journal has been cited in a particular year.")

JCR Category	Total number of Titles	% to which library has access	% of upper half when ranked by Total Cites to which Library has access	% of upper half when ranked by Impact Factor to which the library has access
Environmental Sciences	131	47%	35%	60%
Planning and Development	39	64%	53%	74%

The library provides access to a number of indexes relevant to the topics of this course: CompuScience (1976/77-Current), IEEE Xplore, Computer and Information Systems Abstracts (1981-Current), Internet & Personal Computing Abstracts (1989-Current), Science Direct (1995-Current), EIS: Digests of Environmental Impact Statements (1985-Current), Conference Papers Index (1982-Current), and Environmental Engineering Abstracts (1990-Current). Other broader, but still relevant, indexes include Academic Search Elite, MasterFile Premier, InfoTrac OneFile, and ABI Inform.

Although journal articles are the most effective way to support doctoral-level research, a solid, up-to-date monograph collection is also necessary. LC Subject Headings relevant to each of the courses were chosen, and, for each, the total number of titles in the library's collection is given, as is the number of titles published in the last five years.

LC Subject Heading	Number of Titles in Atkins Library	Number of Titles in Atkins Library published since 1999
Data mining	82	55
Earth Sciences – Statistical methods	7	4
Environmental sciences – Statistical methods	6	3
Geographic information systems	206	59
Geography – Statistical methods	42	5
Geology – Statistical methods	27	9
Hydrology – Statistical methods	6	0
Infrastructure	296	83
Population geography – Statistical methods	2	1
Public health – Statistical methods	6	3
SAS	20	1
Spatial analysis (statistics)	51	10
SPSS	25	2

Evaluator's Signature _____
Date _____



Consultation on Library Holdings

To: John Diemer, Infrastructure and Environmental Systems

From: Anne Osterman, Library

Date: October 14, 2004

Subject: INES 8690, Seminar

Check One:

- 13. Holdings are superior _____
- 14. Holdings are adequate _____ **X**
- 15. Holdings are adequate only if Dept. purchases additional items. _____
- 16. Holdings are inadequate _____

Comments:

Library holdings are adequate for the course, INES 8690, Seminar. Some areas of concern are environmental sciences and ecology journals and the currency of the print collection for the following subjects: atmosphere, atmospheric circulation, climatology, and waste management.

A review of journal titles listed in the 2003 Journal Citation Reports Social Sciences and Sciences editions under the following categories indicated adequate journal holdings. (Paper, microform, or electronic format counted as holdings for a title. Many of the titles had multiple routes of access.) An access assessment was done of the percentage of the total number of titles in a category, the percentage of titles owned that were in the top half ranked by total number of cites (year 2003), and the percentage of titles owned that were in the top half ranked by Impact Factor. (Impact Factor, according to JCR, is "a measure of the frequency with which the 'average article' in a journal has been cited in a particular year.")

JCR Category	Total number of Titles	% to which library has access	% of upper half when ranked by Total Cites to which Library has access	% of upper half when ranked by Impact Factor to which the library has access
Biodiversity Conservation	21	43%	30%	50%
Ecology	105	50%	37%	62%
Energy & Fuels	62	53%	45%	61%
Environmental Sciences	131	47%	35%	60%

Environmental Studies	50	70%	64%	76%
Geosciences, Multidisciplinary	128	52%	45%	58%
Planning and Development	39	64%	53%	74%
Urban Studies	28	71%	64%	79%
Water Resources	55	51%	41%	63%

The library provides access to a number of electronic indexes relevant to the topics of this course: Ecology Abstracts (1982-Current), Pollution Abstracts (1981-Current), Water Resources Abstracts (1967-Current), GeoRef (1785-Current), EIS: Digests of Environmental Impact Statements (1985-Current), Conference Papers Index (1982-Current), Aquatic Sciences and Fisheries Abstracts (1978-Current), Energy Citations Database (1948+), Environmental Engineering Abstracts (1990-Current), and GEOBASE. Other broader, but still relevant, indexes include Academic Search Elite, MasterFile Premier, InfoTrac OneFile, and ABI Inform. These general databases all contain a number of the titles used in the above journal analysis.

Although journal articles are the most effective way to support doctoral-level research, a solid, up-to-date monograph collection is also necessary. LC Subject Headings relevant to each of the courses were chosen, and, for each, the total number of titles in the library's collection is given, as is the number of titles published in the last five years.

LC Subject Heading	Number of Titles in Atkins Library	Number of Titles in Atkins Library published since 1999
Atmosphere	304	22
Atmospheric circulation	44	0
Biosphere	49	9
Climatology	219	11
Ecology	4183	763
Environmental management	127	64
Environmental monitoring	340	55
Environmental policy	1869	346
Geology	4032	426
Global environmental change	51	29
Hydrology	847	91
Industrial ecology	11	7
Infrastructure	296	83
Nature – Effect of human beings on	354	63
Waste management	148	17
Water balance	28	11

Evaluator's Signature _____

Date _____

CONSULTATION LETTERS FROM OTHER DEPARTMENTS AND PROGRAMS

TO: Dr. John Diemer, Interim Associate Director
INES Ph.D. Program

FROM: Dr. David Young, Chairman
Department of Civil Engineering

DATE: October 12, 2004

RE: New course proposals for INES 8101, INES 8102, INES 8110,
and INES 8690

The Department of Civil Engineering enthusiastically supports the establishment of the four courses referenced above. Comprising the core of the INES Ph.D. program, these four courses are essential to the achievement of the program's educational objectives. Our department and its faculty look forward to actively participating in the development and teaching of these courses.

Dear Dr. Diemer,

I have read your proposed additions to the INES Program. The Department of *Geography and Earth Sciences* strongly endorses these course additions and looks forward to providing all the support necessary to make the INES Program a success.

Jerry Ingalls
Chair, Department of *Geography and Earth Sciences*
Director, Ph.D. in Public Policy
University of North Carolina Charlotte
Charlotte, NC 28223
704-687-4260 Office
704-687-3182 Fax
gingalls@email.uncc.edu

FROM: Mark Clemens, Chair, Dept of Biology
TO: John Diemer
DATE: October 4, 2004
RE: Support Letter

John,

Since I sat on the committee that devised the original curriculum it would take a truly bizarre fit of sociopathy to lead me or the biology department to have any objection to the proposed courses. Hmm, it's tempting. Actually, I have discussed these issues with Todd Steck, our representative on the curriculum committee for the program and we are highly supportive of both the courses and the program.

Mark

Dear John:

The Engineering Management Program offers its support of the INES course proposal to add four courses: INES 8101, INES 8102, INES 8110, and INES 8690. We believe these courses will serve the INES Ph.D. Program well and look forward to continuing collaboration between the two programs.

Best Regards,

Gary Teng

S. Gary Teng, Ph.D., PE
Director and Associate Professor

Engineering Management Program
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