

PSPR Self Study Report

Disaster Science and Management Program

Masters of Science

Fall 2015

October 29, 2015

Table of Contents

A. Academic Program Approval Form requesting permanent status.	2
B. Copy of Faculty Senate resolution granting provisional status.....	3
C. Copy of the original program proposal that was submitted for provisional status.	4
D. Graduate program policy document.....	5
E. Assessment of library resources available to support the graduate program as provided by the UD Library	6
F. Self study report.....	7
G. Appendices for supporting documentation	23

A. Academic Program Approval Form requesting permanent status.

UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. Detailed instructions for the proposal should be followed. A [checklist](#) is available to assist in the preparation of a proposal. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Sue McNeil phone number x6578

Department: Disaster Science and Management MS program_email address_smcneil@udel.edu

Date: October 5, 2015

Action: Request for Permanent Status
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term Retroactive to 14F
(use format 04F, 05W)

Current degree MS – Masters of Science
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: MS – Masters of Science
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: Not applicable
Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major / Concentration: _____
(Example: Applied Music – Instrumental degree BMAS)

Undergraduate minor: _____
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change: _____
(Must attach your Graduate Program Policy Statement)

Graduate Program of Study: _____
(Example: Animal Science: MS Animal Science: PHD Economics: MA Economics: PHD)

Graduate minor / concentration: _____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, either describing the new program or highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the

overall program objectives of the major/minor/concentrations)?

(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

No new or revised curriculum is part of this request for permanent status.

Supply support letter from the Library, Dean, and/or Department Chair if needed

(all new majors/minors will need a support letter from the appropriate administrator.)

Support letters from the library, Dean of the College of Arts and Science and Director of the School of Public Policy and Administration are attached in Sections E. and G.4 of the attached self study report.

Supply a resolution for all new majors/programs; name changes of colleges, departments, degrees; transfer of departments from one college to another; creation of new departments; requests for permanent status. See example of resolutions.

Resolution for Permanent Status for Disaster Science and Management Masters of Science program. Recommendation from the Faculty Senate Committee on Graduate Studies (Charles Swanik, Chair) with the concurrence of the Coordinating Committee on Education (Prasad Dhurjati, Chair) and the Executive Committee (Bob Opila, Chair) for the request for Permanent Status for the degree Master of Science (MS) (thesis and non-thesis) in Disaster Science and Management.

WHEREAS, the Faculty Senate granted provisional approval for five years to the MS degree in Disaster Science and Management effective September, 2009, and

WHEREAS, the Disaster Science and Management program has been successful in attracting and graduating excellent students, and

WHEREAS, the graduates of the program are pursuing further education and careers in industry, government, or non-profit organizations with a focus on emergency management and disasters and

WHEREAS, the Disaster Science and Management program is consistent with "Delaware Will Shine" strategic initiative in its commitment to excellence and consequentiality and with the guiding principles, be it therefore

RESOLVED, that the Faculty Senate recommends permanent approval for the Master of Science in Disaster Science and Management, effective September 2014.

Explain, when appropriate, how this new/revised curriculum supports the 5 goals of undergraduate education: <http://www2.udel.edu/gened/>

Not applicable

Identify other units affected by the proposed changes:

(This would include other departments/units whose courses are a required part of the proposed curriculum. Attach permission from the affected units. If no other unit is affected, enter "None")

Support letters from the following units appear in Section G.6 of the attached self study.

Civil Engineering and Environmental Engineering – Tripp Shenton

Education – Ralph Ferretti

Geography – Del Levia

Marine Science and Policy - Mark Moline

Describe the rationale for the proposed program change(s):

(Explain your reasons for creating, revising, or deleting the curriculum or program.)

No program changes are proposed as part of this request for permanent status. As documented in the original proposal and self study, Disaster Science and Management is an important area. Our interdisciplinary program is unique in that it is not a training program but grounded in research and aimed at educating the future stewards of the discipline.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.) See example of side by side.

The curriculum as it appears in the Course Catalog is provided in the self study section F-1-d.

ROUTING AND AUTHORIZATION:

(Please do not remove supporting documentation.)

Department Chairperson *Rich Ware* Date 10/27/15

Dean of College _____ Date _____

(By signing above, the Dean confirms that their college policies and bylaws have been followed correctly during consideration of the request described in this form.

The approval actions that were taken at the college level were (check all that apply) :

_____ college faculty vote; _____ college curriculum approval _____ college senate approval

Chairperson, College Curriculum Committee _____ Date _____

Chairperson, Senate Com. on UG or GR Studies _____ Date _____

Chairperson, Senate Coordinating Com. _____ Date _____

Secretary, Faculty Senate _____ Date _____

Date of Senate Resolution _____ Date to be Effective _____

Registrar _____ Program Code _____ Date _____

Vice Provost for Academic Affairs & International Programs _____ Date _____

Board of Trustee Notification _____ Date _____

B. Copy of Faculty Senate resolution granting provisional status.

UNIVERSITY FACULTY SENATE

APRIL 20, 2009

Recommendation from the Committee on Graduate Studies
(Paul Mettler, Chair) with the concurrence of the Coordinating
Committee on Education (Cihan Cobanoglu, Chair) and the
Executive Committee (Amy Johnson, Chair) for the request to add
a new M.S. in Disaster Science and Management
([attachment](#)) ([attachment](#)) ([attachment](#))
([program policystatement](#)) ([catalog description](#)) ([resolution](#))

WHEREAS, the proposed MS (both thesis and non-thesis) and PhD in
Disaster Science and Management (DISA) program is a
unique interdisciplinary graduate course of study covering
the theories, research methodologies, and policies
informing efforts focused on emergency preparedness,
mitigation, management, and response, and

WHEREAS, there has been much interest over several years from
individuals with diverse backgrounds and interest in
pursuing interdisciplinary graduate studies in disaster
science and management, and

WHEREAS, the experience of the Disaster Research Center with
graduate level research and training, and collaboration with
the School of Urban Affairs and Public Policy provide
existing courses and a foundation for the program, and

WHEREAS, the proposed program contributes to three milestones on
the University's "path to prominence": to become a premier
research and graduate university; to achieve excellence in
professional education; and the engaged university, be it
therefore

RESOLVED, that the Faculty Senate recommends approval
provisionally, for five years, the establishment of a new
major leading to the MS degree in Disaster Science and
Management, effective September 1, 2009.

Approved

C. Copy of the original program proposal that was submitted for provisional status.

Section G, Appendix 1.

D. Graduate program policy document.

INTERDISCIPLINARY GRADUATE PROGRAM IN DISASTER SCIENCE AND MANAGEMENT (DISA)

Revised September 26, 2012, April 21, 2015

Program Policy Statement

TABLE OF CONTENTS

1	Program History	3
1.1	Mission Statement	3
1.2	Origin of the Program	3
1.3	Description of the Planning Process.....	4
1.4	Current Status.....	4
1.5	Degrees Offered	4
2	Admission.....	4
2.1	University Policy on Admission	5
2.2	University Admission Procedures.....	5
2.3	Expected Minimum Requirements for Admission into the Disaster Science and Management Program.....	6
2.4	Admission Application Processing	7
2.5	Admission Status.....	7
3	Degree Requirements for the Master of Science in Disaster Science and Management.....	8
3.1	Course Requirements Non-Thesis Option.....	8
3.2	Course Requirement Thesis Option	9
3.3	Planned Program of Study and Revisions	11
3.4	Regulations Governing Theses.....	11
3.5	Articulation between Master's and Doctoral Degrees	12
4	Degree Requirements for the Doctor of Philosophy in Disaster Science and Management.....	13
4.1	Course Requirements	13
4.2	Planned Program of Study and Revisions	14
4.3	Regulations Governing Comprehensive/Qualifying Examination.....	14
4.4	Regulations Governing Dissertations.....	15
4.5	Residency Requirements	17
4.6	University Requirements and Deadlines for Admission to Doctoral Candidacy.....	17
4.7	Registration Requirements Prior to Doctoral Candidacy	17
4.8	Registration Requirements after Admission to Candidacy	18
5	Assessment	18
5.1	Purpose and Goals.....	18
5.2	Measurements of Learning Objectives.....	19
6	General Information Relevant to Both Master's and Doctoral Degree Candidates ..	19
6.1	Financial Assistance	19

6.2	Graduate Course Numbering System.....	19
6.3	Application for Advanced Degree.....	19
6.4	Graduate Grade Point Average	20
6.5	Time Limits for Completion of Degree Requirements	20
6.6	Extension of the Time Limit	20
6.7	Sustaining Status for Candidates Pursuing Thesis/Dissertation Degree Option	20
6.8	Transfer of Credit Earned as a Continuing Education Student at the University of Delaware.....	21
6.9	Transfer of Credit from Another Institution.....	21
6.10	Transfer of Credit from the Undergraduate Division of the University of Delaware	21
6.11	Credit for “Special Problem” Course Taken as a Graduate Student	22
6.12	Expiration of Credit.....	22
7	Program Administrative Structure.....	22
	Appendix A. Elective Classes by Thematic Area.....	23
	Appendix B. Methods Classes	30
	Appendix C. Sample Plans of Study - PhD	33

1 Program History

The increased frequency and cost of natural, technological and human-induced disasters has demonstrated the importance of social systems to prepare for, respond to, and restore functions after emergent disaster events. The many dimensions of these objectives point to an urgent need for well-rounded, interdisciplinary professionals and scholars in this field.

1.1 Mission Statement

The Disaster Science and Management (DISA) program is an interdisciplinary course of study that teaches the theories, research methodologies, and policies informing efforts focused on emergency preparedness, mitigation, management, and response.

The program builds on the unique strengths and international reputation of the Disaster Research Center (DRC) and related programs and research at the University of Delaware.

The mission of the proposed program is to educate and promote interdisciplinary scholarship in Disaster Science and Management. This program offers a thesis and non-thesis Master's of Science and a PhD degree. The programs include a core curriculum, electives, internships and where applicable, research.

The program will involve faculty from all Colleges at the University of Delaware and foster sustained partnerships with federal, state, and regional agencies, such as the Federal Emergency Management Agency (FEMA) and Delaware Emergency Management Agency (DEMA) to support student research and internships. The program will also create and foster opportunities to secure new grants and fellowships for Disaster Science and Management.

1.2 Origin of the Program

The Disaster Research Center at the University of Delaware is a leading center in the study of the social science of disasters. Grounded in sociology, DRC's research is increasingly multi- and inter-disciplinary. At the same time, faculty in other units on campus are also conducting related research, and overall there is increasing awareness of the importance of the both short- and long-term impacts of disasters. This graduate program in "Disaster Science and Management" complements ongoing and new research, leverages existing programs, and is both timely and relevant.

In the summer of 2006, Provost Rich established the Committee for a Graduate Program in Disaster Science and Management. The purpose of the committee is to explore program options, building on the existing programs and research in the Disaster Research Center (DRC).

1.3 Description of the Planning Process

The proposal was formed by the Committee for a Graduate Program in Disaster Science and Management, a group of thirteen faculty representing all Colleges at the University of Delaware. The committee was chaired by Sue McNeil (Civil and Environmental Engineering and Director of the Disaster Research Center) and the members are: Burt Abrams (Economics), Benigno Aguirre (Sociology and DRC), James Corbett (Marine and Earth Studies), Tracy DeLiberty (Geography), Russell Dynes (DRC), Debra Hess Norris (Art Conservation), Joann Nigg (Sociology and DRC), Havidan Rodriguez (Provost's Office and DRC), Rick Sylves (Political Science), Jeff Raffel (CHEP), Eric Rise (Criminal Justice), Tom Sims (Agriculture and Natural Resources), and Jim Richards (Health Sciences). The committee met regularly over the past nine months to develop an outline for a new program. Meetings included an analysis of strengths, weaknesses, opportunities, and threats (SWOT) related to disaster studies and a careful review of relevant existing courses and alternate administrative structures. Committee members examined existing graduate programs in disaster studies nationally, met with potential employers and prospective students and conducted a full-day work session to develop the draft program policy statement.

The committee considered program structure, opportunities for recruiting students, other related programs and the potential employers of graduates.

Draft copies of the proposal were circulated to interested faculty, administrators, and external experts and two lunch-time meetings were held with faculty and administrators from possible cooperating departments and centers in April 2007. Comments and suggestions were gathered and incorporated into the final proposal. We also met with graduate students at the Disaster Research Center, the 2007 NSF REU at the DRC, the Sociology and Criminal Justice faculty, and the School of Public Policy and Administration faculty. We also presented a poster at the Annual Natural Hazards Workshop in Boulder Colorado.

The MS and PhD programs in Biomechanics and Movement Science served as an interdepartmental prototype. This program places emphasis on the plan of study, and selecting an advisor at the application stage. We have also placed emphasis on the plan of study and the need to have an advisor to be admitted to the program.

1.4 Current Status

The program was approved in April, 2010. The first cohort of students were admitted for Fall 2010.

1.5 Degrees Offered

The degrees awarded to those who complete this program will be either a Master's of Science in Disaster Science and Management (both thesis and non-thesis options), or a Doctor of Philosophy in Disaster Science and Management.

2 Admission

2.1 University Policy on Admission

Admission to the graduate program is competitive. Those who meet stated minimum requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer appropriate strengths.

2.2 University Admission Procedures

Applicants must submit all of the following items directly to the Office of Graduate Studies using the [online admissions process](#) before admission can be considered:

1. A completed application must be submitted no later than February 1 for the fall semester, and October 1 for spring semester.
2. A \$70 nonrefundable application fee must be submitted with the application. Credit card payment is accepted with the online application. Checks must be made payable to the University of Delaware. Applications received without the application fee will not be processed. Foreign students must use a check drawn on a U.S. bank or an International Postal Money Order.
3. Applicants must submit essays to specific questions asked on the application; a resume; and a statement of professional goals and objectives.
4. Applicants must submit at least three letters of recommendation. All letters of recommendation should be mailed collectively to the Office of Graduate Studies.
5. The Graduate Record Examination (GRE) admission test scores are required. Applicants should request Education Testing Services (ETS) to report official test scores directly to the University of Delaware. The University of Delaware's institutional code for ETS is 5811. Applicants are encouraged to submit student copies of tests scores in their application packets.
6. One official transcript of all U.S. colleges attended must be sent directly from the institution to the Office of Graduate Studies or be provided in a sealed envelope with the application packet. Students who have attended the University of Delaware need not supply a transcript from Delaware.
7. One official transcript of all non-U.S. based college records is required. The transcript must list all classes taken and grades earned. If the transcript does not state that the degree has been awarded, send a degree certificate that states that the degree has been awarded. If the degree has not been awarded or the degree certificate has not been issued, evidence of the awarded degree must be provided prior to the first day of classes in the term of admission. For institutions that issue documents only in English, send the English original. For institutions that issue documents both in English and a foreign language, send both the English language original and the foreign language original. For institutions that issue documents only in a foreign language, send the foreign language original and a certified translation in English. The translation must be certified by an official of the issuing institution, a state- or court-appointed translator, or the Embassy of the issuing country in the United States. If it is necessary to send non-original documents:
 - a. The documents must be original "attested copies," officially attested to by the issuing institution or the Embassy of the issuing country in the United States; and

- b. Certified translations must be originals, no copies will be accepted.
8. International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not the first language. The Test of English as a Foreign Language (TOEFL) is offered by the Educational Testing Service in test centers throughout the world. The University requires an official paper-based TOEFL score of at least 550, at least 213 on the computer-based TOEFL, or at least 79 on the Internet-based TOEFL for an applicant to be considered for admission. In addition, departments may elect to require that the applicant provide a score from the TSE (Test of Spoken English). TOEFL scores and TSE/SPEAK scores more than two years old cannot be validated or considered official.

International students must be offered admission to the University and provide evidence of adequate financial resources before a student visa will be issued. The University has been authorized under federal law to enroll nonimmigrant alien students. The University has more than 1000 international graduate students enrolled from more than 96 countries. International students are required to purchase the University-sponsored insurance plan or its equivalent.

All first-time international students are required to attend the Orientation Day for new international students, which takes place on the Friday before classes begin.

9. It is a Delaware State Board of Health regulation and a University of Delaware mandate that all graduate students with a birth date after January 1, 1957, be immunized for measles, mumps and rubella (MMR). Also, students may be required to provide evidence of PPD (Mantoux) Tuberculosis Screening Test within 6 months prior to beginning classes. Students who are admitted beginning January 2002 are required to show proof of vaccination against meningococcal disease unless granted a waiver. Students should refer to and complete the Student Health Service Immunization Documentation form upon admission.
10. A supplemental application form indicating interest in financial support through research centers.

2.3 Expected Minimum Requirements for Admission into the Disaster Science and Management Program

Admissions decisions are made by the Program Committee of the Disaster Science and Management Program. Students will be admitted to the program based on enrollment availability and their ability to meet the following minimum recommended entrance requirements. Applicants to the MS program must have:

- Baccalaureate degree from an accredited college or university.
- An undergraduate GPA of 3.0 or higher
- Written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and

explains how admission to the program will facilitate his or her professional objectives.

GRE scores in the sixty-fifth percentile or better for the verbal section and fiftieth percentile or better for the quantitative section, and a score of 4.0 or above on the analytical section are recommended.

Applicants to the PhD Program must have

- MS or equivalent degree from an accredited college or university
- A graduate GPA of 3.5 or higher.
- Written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his or her professional objectives.

GRE scores in the sixty-fifth percentile or better for the verbal section and fiftieth percentile or better for the quantitative section, and a score of 4.0 or above on the analytical section are recommended.

All students are also expected to demonstrate competence in oral and written communication. Knowledge of mathematics and statistics is strongly encouraged. All admitted students must have an advisor.

2.4 Admission Application Processing

The admission process is completed as follows; First, completed applications consisting of the application form, undergraduate/graduate transcripts, official GRE scores, letters of recommendations, resume, statement of purpose, and written statement of goals and objectives are reviewed by the Program Committee of the Disaster Science and Management Program. Pending a successful review of the initial application materials, the application is circulated to all the Disaster Science and Management faculty in an effort to match the student with an advisor. Faculty members advise students whose background, goals and objectives are compatible with their own research and funding. The Program Committee arrives at an admission decision after reviewing the completed application. To be admitted a student must have an advisor.

The Program Committee of the Disaster Science and Management Program will begin reviewing applications in February and may require a period of two to three months to process completed applications.

2.5 Admission Status

Students admitted to the Disaster Science and Management Program may be admitted into one of three categories:

1. Regular. Regular status is offered to students who meet all of the established entrance requirements, who have a record of high scholarship in their fields of

- specialization, and who have the ability, interest, and maturity necessary for successful study at the graduate level in a degree program.
2. **Provisional.** Provisional status is offered to students who are seeking admission to the degree program but lack one or more of the specified prerequisites. All provisional requirements must be met within the deadline given before regular status can be granted. Students admitted with provisional status are generally not eligible for assistantships or fellowships. Students who file an application during the final year of undergraduate or current graduate work and are unable to supply complete official transcripts showing the conferral of the degree will be admitted pending conferral of the degree if their records are otherwise satisfactory and complete.
 3. **Visiting Student Scholars.** Visiting scholar admission is offered to students who wish to transfer graduate credits to another institution. Visiting students must submit a letter from their graduate dean or registrar certifying that they are graduate students in good standing at another institution. Such letters will be accepted in lieu of the transcripts and GRE scores which are required of all other applicants. Visiting scholar status is generally limited to a period of two years and is a non-degree status. If visiting students desire to transfer to regular status at the University of Delaware, they must meet the stated admissions standards. Admission as a visiting student implies no commitment about later admission as a regular student or about transferability of courses from the student's original institution.

3 Degree Requirements for the Master of Science in Disaster Science and Management.

3.1 Course Requirements Non-Thesis Option

The Master of Science in Disaster Science and Management (Non-Thesis Option) requires 30 credits including 24 credits of graduate level coursework, 2 semesters of seminar (2 semesters at 1 credit per semester and additional semesters as a listener), 4 credits of practicum, and 6 credits of thesis. The 24 credits of coursework are specified in the student's plan of study and must include:

Three core courses (9 credits):

- DISA 650 - Overview of Disaster Science and Management
- DISA 651 - International Comparative Analysis of Disasters
- DISA 670 – Issues in Disaster Response

Research Methods/Analysis Courses (3 credits):

- EDUC 665 – Elementary Statistics, or
- UAPP 808 Qualitative Methods for Program Evaluation, or
- if appropriate UAPP704 Statistics for Policy Analysis, or EDUC 850 – Qualitative Research in Education

Public Policy and Organizational Decision Making (3 credits):

- UAPP 698 – Management Decision Making for Public and Non-Profit Sectors (3 credits) or
- MAST 663 - Decision Tools for Policy Analysis (3 credits)

Elective Courses: (9 Credits). Suggested elective courses can be found in Appendix A.

Other requirements are:

DISA 680 Disaster Science and Management Seminar (1 credit)

Taken two semesters for credit, additional semesters as a listener

DISA 857 Practicum (1-3 credits)

A one credit course in the spring semester is followed by a 3 credit summer internship. Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc. Study abroad is also strongly encouraged.

A sample program of study is shown in Table 1 assuming one year of full-time study.

Table 1. Plan of Study for MS (Non-Thesis Option).

Fall	Spring	Summer
DISA 650 Overview of Disaster Science and Management (3)	DISA 651 Int Comp Anal of Disasters (3)	DISA 857 Practicum (3)
Elective I (3)	DISA 670 Issues in Disaster Response (3)	
Elective II (3)	UAPP 808 Qualitative Methods for Program Evaluation (3)	
DISA 680 Seminar (1)	DISA 680 Seminar (1)	
UAPP 698 – Management Decision Making (3)	DISA 857 Practicum (1)	
	Elective III (3)	

L = Listener, Total 30 credits

3.2 Course Requirement Thesis Option

The Master of Science in Disaster Science and Management (Thesis Option) requires 30 credits including 21 credits of graduate level coursework, 4 semesters of seminar (2 semesters at 1 credit per semester and 2 semesters as a listener), 1 credit of practicum, and 6 credits of thesis. The 21 credits of coursework are specified in the student's plan of study and must include:

Three core courses (9 credits):

- DISA 650 - Overview of Disaster Science and Management
- DISA 651 - International Comparative Analysis of Disasters
- DISA 670 – Issues in Disaster Response

Research/Methods/Analysis Courses (6 credits):

- EDUC 665 – Elementary Statistics (or if appropriate UAPP 815 Public Management Statistics)
- UAPP 808 Qualitative Methods for Program Evaluation (or if appropriate EDUC 850 – Qualitative Research in Education)

Public Policy and Organizational Decision Making (3 credits):

- UAPP 698 – Management Decision Making for Public and Non-Profit Sectors (3 credits) or
- MAST 663 - Decision Tools for Policy Analysis (3 credits)

DISA 680 Disaster Science and Management Seminar (1 credit)

Taken four semesters – two semesters for credit, two semesters as a listener

DISA 857 Practicum (1 credit)

One-credit internship course in spring semester, followed by the summer internship (no credit) Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc. The practicum can also be substituted by a research project at DRC. Study abroad is also strongly encouraged.

Thesis (6 credits)

Elective Course: (3 Credit). Suggested elective courses can be found in Appendix A.

A sample program of study is shown in Table 2.

Table 2. Plan of Study MS (Thesis Option)

Fall – Year 1	Spring – Year 1	Summer
DISA 650 Overview of Disaster Science and Management (3) EDUC 665 – Elementary Statistics (3) Elective (3) DISA 680 Seminar (1)	DISA 670 Issues in Disaster Response (3) UAPP 808 Qualitative Methods for Program Evaluation (3) DISA 857 Practicum (1) DISA 680 Seminar (1)	Internship (no credit)
Fall Year 2	Spring – Year 2	
UAPP 698 – Management Decision Making (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	DISA 651 Int Comp Anal of Disasters (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	

L = Listener

Total 30 credits

3.3 Planned Program of Study and Revisions

Students are required to work with their advisor during their first semester of study and develop a plan of study. The plan of study must first be approved by the advisor and then by the Program Committee by the end of the first semester of study for the MS. A copy must be sent to the Office of Graduate Studies. Students may need to alter approved programs of study once they have entered the program due to reasons that can include scheduling conflicts or the creation of new courses directly related to the student's goals. Students who wish to make changes to their program of study should first obtain permission from their advisor. The student must then make a written request to the Executive Committee to revise the program of study. The advisor must then make a written request to the Program Director to revise the program of study.

3.4 Regulations Governing Theses

1. Establishment of Thesis Committee: The student and his/her advisor will create a thesis committee at the time the student begins to develop the thesis proposal. The thesis committee shall include three University faculty from within the Disaster Science and Management Program, and may have no more than six members. The thesis advisor must be a member of the Disaster Science and Management faculty and at least one of the Disaster Science and Management committee members must be from a different department than that of the advisor. With the approval of the Disaster Science and Management Program Committee, a professional staff member who holds a secondary faculty appointment within an academic department may serve as a committee member. Faculty who have retired or resigned from the University may maintain committee membership or continue to chair committees of students whose work began under their direction prior to their retirement or departure from the University. Disaster Science and Management faculty who do not have regular faculty status may co-chair the thesis committee provided that the other co-chair meets the definition for regular faculty status. It is the responsibility of the thesis advisor to replace members who withdraw from the committee during the thesis process.
2. Defense of the Thesis Proposal: The format of the thesis must adhere to guidelines specified in the University's Thesis and Dissertation Manual. The manual is available electronically on the Web at <http://www.udel.edu/gradoffice/forms/thesismanual.pdf> . A copy of the thesis proposal must be delivered to the members of the thesis committee at least two weeks in advance of the proposal defense. Prior to the presentation, proposals that involve the use of human subjects must receive approval from the University Institutional Review Board (IRB). Details for creating consent forms and submitting studies for review by the IRB can be obtained from the Office of Research.

The thesis proposal defense will be scheduled only after a majority of members of the thesis committee have determined that a defense is appropriate. It is expected that the proposal shall be presented early in the third semester. The thesis proposal defense will be open to the public, and invitations will be sent to all Disaster Science and Management faculty and students at least one week prior to the date

of the defense. The candidate will present a summary of the proposed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the thesis committee will meet to decide whether the proposal is accepted, rejected, or accepted with stipulations. Results of the meeting will then be presented to the student. The student receives a passing grade if the majority of the committee members vote in favor of a passing grade.

Thesis committee members will sign the final copy of the approved proposal. A signed copy of the approved thesis proposal will be forwarded to the program director. Students who fail the thesis proposal defense will receive one additional opportunity to repeat the process and defend a new or modified thesis proposal.

3. Defense of the Thesis: The format of the thesis must adhere to the University's Thesis and Dissertation Manual. This document is available on the University's website. A copy of the thesis must be delivered to each of the members of the thesis committee at least one week prior to the thesis defense. The thesis defense will be scheduled only after the chair of the thesis committee has determined that a defense is appropriate.

The thesis defense will be open to the public, and invitations will be sent to all Disaster Science and Management faculty and students at least one week prior to the defense. The candidate will present a summary of the completed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the thesis committee will meet privately to decide whether the thesis is accepted, rejected, or accepted pending revisions. Results of the meeting will then be presented to the student. The student receives a passing grade if the majority of the committee members vote in favor of a passing grade.

Master's theses are due in the Office of Graduate and Professional Studies approximately six weeks prior to the date of degree conferral. Actual dates are posted on the website <http://www.udel.edu/gradoffice/polproc/#steps>.

4. Processing the Final Document: Instructions for preparing the final document are posted on the website of the Office of Graduate and Professional Studies <http://www.udel.edu/gradoffice/polproc/#steps>

3.5 Articulation between Master's and Doctoral Degrees

The non-thesis option Master's degree is considered to be a terminal degree in Disaster Science and Management at University of Delaware. The thesis option Master's degree in Disaster Science and Management is also considered terminal unless the student plans to continue in a doctoral program. Students receiving their Master's degree at the University of Delaware are not eligible to remain classified as graduate students and are automatically reclassified CEND (Continuing Education Nondegree) in any subsequent semester that they register following degree clearance unless the department, with the

approval of the Graduate Office, has already admitted them to a doctoral program. The procedures for changing status after earning a Master's degree are as follows:

If a Master's degree candidate is continuing toward a doctoral degree in the same major as the Master's degree, the student should request that the department submit a Change of Classification Form at the same time or before the student submits an application for the Master's degree. If the department is unable to determine the student's eligibility to pursue a doctoral degree until after the Master's degree is awarded, the department should notify the Office of Graduate Studies by writing such a statement on the student's Master's degree application. A student's classification changes from regular status in a Master's degree program to precandidacy when admitted to a doctoral program.

If a Master's degree candidate desires to continue toward a doctoral degree in a different major than the Master's degree, the student should submit a completed admission application form to the Office of Graduate Studies and follow the same procedure for admission as any other applicant.

4 Degree Requirements for the Doctor of Philosophy in Disaster Science and Management

4.1 Course Requirements

The Doctor of Philosophy in Disaster Science and Management requires 42 credits of graduate-level coursework beyond the Master's degree including 9 credits of dissertation. Students are expected to choose a thematic area such as:

- Organizations, management and leadership – focus on management and leadership in all phases of a disaster. Includes knowledge of institutional structures and tools to support decision making.
- Built and natural environment, and society – focus on the interfaces between the three different infrastructures – built, natural and social with an emphasis on the opportunities to control, influence, accommodate and understand changes and needs during and after catastrophic events.
- Vulnerability and resilience – focus on how systems are impacted by and respond to catastrophic events. Includes how systems can be modified or adapted to reduce vulnerability and improve resilience.
- Policy and planning – focus on response to disasters including continuity of operations.
- Simulation and modeling – focus on decision support tools and the modeling of impacts to support disaster planning, mitigation, response and recovery.
- Health systems leadership: public health disaster planning and response – focus on the role of health professionals and systems in planning for and responding to disasters.

The 42 credits of coursework are specified in the individual planned program of study, and must include:

- At least 9 credits from a thematic area as listed in Appendix A.

- At least 6 credits of research methods (qualitative or quantitative) as listed in Appendix B.
- 9 credits of PhD Thesis in the thematic area
- In addition students must register for and attend three semesters of seminar (DISA 680). Students are expected to participate in seminar as a listener for other semesters that they are on campus.
- At least 15 credits of electives.

Electives are intended to enhance and broaden a student's scholarly involvement in the program. Students in the Doctoral degree program are allowed to take a maximum of 6 credits of independent study (DISA 866) and a maximum of 9 credits of research (DISA 868). However the combined number of credits from research and independent study courses may not exceed 12.

Sample plans of study are included in Appendix C.

4.2 Planned Program of Study and Revisions

Students are required to work with their advisor during their first semester of study and develop a plan of study. The plan of study must first be approved by the advisor and then by the Program Committee by the end of the first semester of study for the PhD.

Students may need to alter a previously approved program of study due to scheduling conflicts, creation of new courses, or change of research focus. Students who wish to make changes to their program of study. Students who wish to make changes to their program of study should first obtain permission from their advisor. The advisor must then make a written request to the Program Director to revise the program of study.

4.3 Regulations Governing Comprehensive/Qualifying Examination

The objective of the DISA Qualifying Examinations is to assess the student's ability to do interdisciplinary analysis, based on sound knowledge of core themes, good analytical methods, and the ability to structure and analyze disaster problems in a way that appropriately integrates the required knowledge, methods, and judgment. The levels of synthesis and evaluation to be demonstrated in these examinations go beyond those expected in most courses, although each student's plan of study is aimed at developing and exercising this level of problem solving. After the second semester of equivalent full-time course work but no later than the fourth semester of equivalent full-time course work has been graded, the student must pass a written and oral qualifying examination prepared by the Qualifier Exam Committee for the cohort of students seeking Ph.D. student candidacy. All core faculty are encouraged to participate in the oral exam. The qualifying examination must be passed before the student proceeds to candidacy.

Several outcomes of the Qualifying Examinations are possible. These are:

1. The student passes the examinations at the Ph.D. level.
2. The student passes at the M.S. level, but ability related to some core themes are not demonstrated at the Ph.D. level. In this case, the student can take an M.S. degree. However, the option is also open to retake the examination(s) one more time when next offered. Students receive individual guidance on whether they should plan to retake the examination or leave the program with an M.S.

3. The student fails the examinations. Such students are almost always advised to withdraw from graduate studies in DISA. They may, however, elect to retake the failed examination(s) one more time when next offered.

Students who retake the Qualifiers must do so the year after the first attempt. Students who have failed one or more parts of the Qualifying Examination normally do not receive graduate assistantship support while waiting to retake the examination.

4.4 Regulations Governing Dissertations

1. Establishment of Dissertation Committee: The student and his/her advisor will create a dissertation committee at the time the student begins to develop the dissertation proposal. The dissertation committee shall include three University faculty from within the Disaster Science and Management Program, and one member from outside of the program. The dissertation advisor must be a member of the Disaster Science and Management faculty, and at least one of the Disaster Science and Management committee members must be from a different department than that of the advisor. With the approval of the Disaster Science and Management Program Committee, one professional staff member who holds a secondary faculty appointment within an academic department may serve as a committee member. However, all three within-program committee members must hold the doctoral degree. Faculty who have retired or resigned from the University may maintain committee membership or continue to chair committees of students whose work began under their direction prior to their retirement or departure from the University. Disaster Science and Management faculty who do not have regular faculty status may co-chair the dissertation committee provided that the other co-chair meets the definition for regular faculty status. Outside committee members must hold a doctoral degree, and shall include individuals not affiliated with the Disaster Science and Management Program. These may be individuals from outside of the University who are nationally recognized for their expertise in the area of study specified by the dissertation. The Executive Committee must approve committee members from outside of the University. It is the responsibility of the dissertation advisor to replace members who withdraw from the committee during the dissertation process.
2. Defense of the Dissertation Proposal: A copy of the dissertation proposal must be available to Disaster Science and Management faculty at least one week prior to the proposal defense. A copy of the dissertation proposal must be delivered to the members of the dissertation committee at least two weeks in advance of the proposal defense. Prior to the presentation, proposals that involve the use of human subjects must receive approval from the University Institutional Review Board (IRB). Details for creating consent forms and submitting studies for review by the IRB can be obtained from the Office of Research.

The dissertation proposal defense will be scheduled only after a majority of members of the dissertation committee have determined that a defense is appropriate. The dissertation proposal defense will be open to the public, and invitations will be sent to all Disaster Science and Management faculty and students at least one week prior to the defense date. The candidate will present a

summary of the proposed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet to decide whether the proposal is accepted, rejected, or accepted with stipulations. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade.

Dissertation committee members should sign the final copy of the approved proposal. A signed copy of the approved dissertation proposal should be forwarded to the program director. Students who fail the dissertation proposal defense will receive one additional opportunity to repeat the process and defend a new or modified dissertation proposal. The program director signs the candidacy form.

3. Defense of the Dissertation: The format of the dissertation must adhere to guidelines specified in the University's Thesis and Dissertation Manual. The manual is available electronically on the Web at <http://www.udel.edu/gradoffice/current/thesismanual.html> or it may be purchased at the University Bookstore. A copy of the dissertation must be made available to Disaster Science and Management faculty at least two weeks prior to the proposal defense. The dissertation defense will be scheduled only after the advisor of the dissertation committee has determined that a defense is appropriate.

The dissertation defense will be open to the public, and invitations will be sent to all Disaster Science and Management faculty and students at least two weeks prior to the defense date. The candidate will present a summary of the completed research, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet to decide whether the dissertation is accepted, rejected, or accepted pending revisions. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade.

4. Processing the Final Document: Three copies of the dissertation must be approved by the chair of the student's advisory committee, the Director of the Disaster Science and Management program, and the Vice Provost for Graduate and Professional Education. The dissertation is to be signed by the professor in charge of the dissertation and all members of the dissertation committee. A separate abstract and abstract approval page must be submitted with the dissertation. The dissertation must be submitted to the Office of Graduate Studies for approval not later than seven weeks prior to the degree conferral date. The dissertation defense must be completed prior to the submission date and the certification of a successful defense must be submitted to the Office of Graduate Studies. Doctoral dissertations and the extra abstract are sent to University Microfilms Inc., to be microfilmed and thereby made available to libraries and scholars. To accomplish this, each candidate must submit a signed University Microfilms Inc. Doctoral

Dissertation Agreement Form to the Graduate Office at the time the dissertation copies are submitted.

The University reserves the right to duplicate a dissertation for distribution to other libraries or for the use of individual scholars. However, the University will not publish a dissertation for general distribution without the written consent of the author. If copyrighting of a dissertation is desired, it may be arranged when the dissertation is submitted to the Office of Graduate Studies. Published works are eligible for copyright protection in the United States if the work is first published in the United States.

4.5 Residency Requirements

At least three academic years of graduate work are normally required for the Ph.D. degree. At least one continuous academic year must be devoted exclusively to full-time study (9 credit hours per semester) in the major field in residence at the University of Delaware. This residency requirement may be fulfilled using a fall and spring semester combination or a spring and fall semester combination, but summer or winter sessions do not meet the qualification. Course credit earned in a Master's program at the University of Delaware may be applied toward the doctoral degree residency requirement if the candidate is receiving both degrees from the University in the same major field.

4.6 University Requirements and Deadlines for Admission to Doctoral Candidacy

Upon the recommendation of the doctoral student's advisory committee and the chair of the student's major department, students may be admitted to candidacy for the Ph.D. degree. The stipulations for admission to doctoral candidacy are that the student has (1) had a program of study approved, (2) completed one academic year of full-time graduate study in residence at the University, and (3) had a dissertation proposal accepted by the advisory committee.

The deadline for admission to candidacy for the fall semester is August 31. The deadline for admission to candidacy for the spring semester is January 31. The deadline for admission to candidacy for the summer is April 30. Responsibility for seeing that admission to candidacy is secured at the proper time rests with the student.

4.7 Registration Requirements Prior to Doctoral Candidacy

Course registration requirements are determined by the student's approved program of study. Once the student has registered for all course requirements in a program of study but has not yet met all of the stipulations for passing into candidacy, the student must maintain registration during the fall and spring semesters in course(s) or in three to twelve credits of Pre-Candidacy Study (DISA 964). Pre-Candidacy Study (DISA 964) is graded pass/fail. If the student registered in Pre-Candidacy Study is admitted to candidacy before the end of the free drop/add period of the next semester, the registration in Pre-Candidacy Study (DISA 964) for the preceding semester may be changed to the course, Doctoral Dissertation (DISA 969). (Students who are classified G1 and are holding a graduate assistantship or tuition scholarship must be registered for a minimum

of six graduate credits, and those holding a fellowship must be registered for a minimum of nine graduate credits.)

4.8 Registration Requirements after Admission to Candidacy

Once a student has met all of the stipulations for candidacy and becomes classified with G2 status (candidacy), the student is required to register in nine credits of Doctoral Dissertation (DISA 969). Students may not register for Doctoral Dissertation (DISA 969) until admitted to candidacy (G2 status). Registration in Doctoral Dissertation (DISA 969) and Doctoral Sustaining (UNIV 999) is restricted to students with G2 status. Once the student has registered in nine credits of Doctoral Dissertation, the student is required to maintain matriculation in the doctoral program by registering in Doctoral Sustaining (UNIV 999) in subsequent semesters until the degree is awarded. All students must be registered in the term in which the degree is officially awarded. Sustaining registration is required in summer session if the degree is awarded at the conclusion of the summer session. (Sustaining registration is never required for winter session because graduate degrees are not awarded at the conclusion of winter session.)

5 Assessment

5.1 Purpose and Goals

The purpose of graduate education in Disaster Science and Management is to provide students with the intellectual ability to understand, create, integrate, and apply sophisticated discipline-specific interdisciplinary knowledge to the disaster preparedness, response, recovery and mitigation. Recognizing that the discipline continues to evolve, students are expected to acquire the vocabulary and critical thinking skills to acquire and evaluate future knowledge. Toward these ends, the following goals for graduate student learning are presented.

Demonstrate breadth and depth of knowledge in the discipline

Graduate students should understand the current and historical theories, concepts, and models of the discipline. They should possess the ability to access and evaluate the literature of the discipline and understand the major issues in the current state of knowledge. In addition to knowing the specific content of the discipline, students should be able to understand and appropriately use the methods and techniques of advancing knowledge in the field of study.

Effectively communicate knowledge in the discipline

Graduate students should possess the ability to write and speak about the current issues of the discipline to peers, practitioners, and the public. They should be able to articulate and demonstrate knowledge of the discipline and write and present scholarship to professionals.

Demonstrate the ability for critical and analytical thinking in the discipline

Graduate students should be able to identify and understand critical issues in the discipline. They should possess the ability to challenge and evaluate information, as well as synthesize and integrate knowledge in the discipline.

Exhibit the best practices, values, and ethics of the profession

Graduate students should understand and exhibit the professional standards for responsible conduct of research in the discipline and understand the values and ethics of practicing the profession in society.

Apply knowledge of the discipline

Graduate students should possess the ability to apply knowledge in the discipline to solve sophisticated problems and to interpret technical issues.

5.2 *Measurements of Learning Objectives*

These learning goals are manifest in the requirements for the M.S. and Ph.D. They are measured directly in the courses through various mechanisms that include: course papers, oral presentations; project reports and final examinations. In the non-thesis MS degree, the internship requires the student to put their classroom learning in context and is evaluated through a brief report. In the MS degree with thesis, the thesis is evaluated by a committee. In the PhD degree, the student is required to complete a qualifying exam and a dissertation, both of which involve a rigorous evaluation by a committee. In addition to these direct measures of the program, every year graduating students complete an exit survey that asks them to rate their attainment of the desired goals as well as various aspects of the program. The results of this survey, class evaluations, performance in qualifying exams, and committee evaluations of theses and dissertations are used to modify the program.

6 *General Information Relevant to Both Master's and Doctoral Degree Candidates*

6.1 *Financial Assistance*

Financial assistance for research students in the DISA program is obtained from a variety of external sources and will therefore vary in form and availability. Assistance will be awarded on a competitive basis to applicants' best fitting the needs of the granting agencies and sponsoring faculty. Students receiving full stipends will be expected to work up to 20 hours per week on faculty projects and students are expected to maintain full-time status. A limited number of scholarships are available for partial support of students in the professional non-thesis option master's degree. These scholarships are awarded on a competitive basis.

6.2 *Graduate Course Numbering System*

Graduate credit may be earned for courses numbered 600 to 699, 800 to 898, and 900 to 998. (Courses numbered 600 to 699 are graduate-level courses open to qualified, advanced undergraduates by permission of the instructor.) Courses numbered 500 to 599 are graduate courses for the nonspecialist and may not be counted for graduate credit in the student's major. With the approval of Disaster Science and Management Program Committee, 500-level courses taken outside the student's major department may be applied toward a graduate degree.

6.3 *Application for Advanced Degree*

To initiate the process for degree conferral, candidates must submit an "Application for Advanced Degree" to the Office of Graduate Studies. The application deadlines are February 15 for Spring candidates, May 15 for Summer candidates, and September 15 for Winter candidates. The application must be signed by the candidate's adviser and by the

director of Disaster Science and Management program. There is an application fee of \$50 for Master's degree candidates and a \$95 fee for doctoral degree candidates. Payment is required when the application is submitted.

6.4 Graduate Grade Point Average

Students must have a minimum overall cumulative grade point average of 3.0 to be eligible for the degree. In addition, the grades in courses applied toward the degree program must equal at least 3.0. All graduate-numbered courses taken with graduate student classification at the University of Delaware are applied to the cumulative index. Credit hours and courses for which the grade is below "C-" do not count toward the degree even though the grade is applied to the overall index. Candidates should see that all final grades have been submitted by their instructors. Temporary grades of "S" (Satisfactory) are assigned for 868 (Research) and 869 (Master's Thesis) and 969 (Doctoral Dissertation) until a final letter grade is submitted upon the completion of the thesis or dissertation.

6.5 Time Limits for Completion of Degree Requirements

Time limits for the completion of degree requirements begin with the date of matriculation and are specifically expressed in the student's letter of admission. The University policy for students entering a Master's degree program is ten consecutive semesters to complete the degree requirements. Students completing the requirements for the Master's degree who are subsequently granted permission to continue toward the doctoral degree are given an additional ten consecutive semesters. Students entering a doctoral program with a Master's degree are given ten consecutive semesters to complete the requirements. Students who change their degree plan and have transferred from one degree program to another degree program are given ten consecutive semesters from the beginning of the first year in the latest program.

6.6 Extension of the Time Limit

An extension of time limit may be granted for circumstances beyond the student's control. Requests for time extensions must be made in writing and approved by the student's thesis/dissertation committee and the director of the Disaster Science and Management program. The director will forward the request to the Office of Graduate Studies. The Office of Graduate Studies will determine the student's eligibility for a time extension and will notify the student in writing of its decision to grant an extension of time.

6.7 Sustaining Status for Candidates Pursuing Thesis/Dissertation Degree Option

Once a graduate student has completed all required course credits needed for the degree (including three credits of Master's thesis [869] or nine credits of PhD thesis [969]) and all other degree requirements except the submission of thesis or dissertation, the student is required to maintain his/her matriculation in the degree program during the fall and spring semesters by registering for either Master's Sustaining: Thesis (UNIV 899) or

Doctoral Sustaining (UNIV 999). All students, including sustaining students, are required to be registered in the semester in which the degree is officially awarded. Sustaining registration is required for summer session if the student completes the degree in summer session. (Sustaining registration is never required for winter session as graduate degrees are not awarded at the conclusion of winter session.)

6.8 Transfer of Credit Earned as a Continuing Education Student at the University of Delaware

Students who complete graduate credits with the classification of CEND (Continuing Education Nondegree) at the University of Delaware may use a maximum of 9 graduate credits earned with this classification toward their graduate degree. The CEND credits, grades, and quality points become a part of the student's academic record and grade point average. CEND credit can be transferred provided that: (a) the course was at the 600-800 level, (b) the course was taken within the time limit appropriate for the degree, (c) the course was approved by the student's adviser and the director of the Disaster Science and Management program, and (d) the course was in accord with the student's approved plan of study.

6.9 Transfer of Credit from Another Institution

Graduate credit earned at another institution will be evaluated at the written request of the student. Such a request should be submitted to the director of the Disaster Science and Management program using a Request for Transfer of Graduate Credit form. A maximum of 9 credits required for the degree will be accepted provided that such credits: (a) were earned with a grade of no less than B-, (b) are approved by the student's adviser and the Disaster Science and Management program, (c) are in accord with the student's approved plan of study, (d) are not older than five years, and (e) were completed at an accredited college or university. The credits, but not the grades or quality points, are transferable to University of Delaware graduate records. Graduate courses counted toward a degree received elsewhere may not be used. Credits earned at another institution while the student was classified as a continuing education student at that institution are not eligible to be transferred to one's graduate degree at the University of Delaware. Credits from institutions outside of the United States are generally not transferable to the University of Delaware.

6.10 Transfer of Credit from the Undergraduate Division of the University of Delaware

Students who wish to transfer credits from their undergraduate record to their graduate record may transfer a limited number by arranging with the department to have these courses approved by their instructors before the courses are taken. These courses must be at the 600-level, and the student must perform at the graduate level. They must be in excess of the total required for the baccalaureate degree, must have grades of no less than B-, and must not be older than five years. The credits, grades, and quality points will transfer.

6.11 Credit for “Special Problem” Course Taken as a Graduate Student

Some 400-level courses may be completed for graduate credit if the graduate student does additional work. Students must register for the course at the graduate level using the departmental number of 666. The student may process a titling form for the 666 numbered course.

6.12 Expiration of Credit

Course credits for the program expire five years after the course has been completed.

7 Program Administrative Structure

The program administrative structure is described in the Faculty Bylaws.

Appendix A. Elective Classes by Thematic Area

The thematic areas were identified by the committee based on the skills identified as education areas for leadership in homeland security at the FEMA Higher Education Conference, June 2006.

- Organizations, management and leadership – focus on management and leadership in all phases of a disaster. Includes knowledge of institutional structures and tools to support decision making.
- Built and natural environment, and society – focus on the interfaces between the three different infrastructures – built, natural and social with an emphasis on the opportunities to control, influence, accommodate and understand changes and needs during and after catastrophic events.
- Vulnerability and resilience – focus on how systems are impacted by and respond to catastrophic events. Includes how systems can be modified or adapted to reduce vulnerability and improve resilience.
- Continuity of operations (policy and planning) – focus on response to disasters including policy and planning.
- Simulation and modeling – focus on decision support tools and the modeling of impacts to support disaster planning, mitigation, response and recovery.
- Health systems leadership: public health disaster planning and response – focus on the role of health professionals and systems in planning for and responding to disasters.

Thematic Areas	Class ¹
Organizations, management and leadership	ACCT ² 800 – Financial Reporting and Analysis
	BUAD ³ 800 – Strategic Thinking for the Executive Leader
	BUAD 870 – Leadership and Organizational Behavior
	BUAD 880 – Marketing Management
	COMM 610 – Organizational Communication Theory
	COMM 630 - Interpersonal Communication Theory
	COMM 670 - Mass Communication Theory
	ECON 503 – Economic Analysis for Business Policy
	ECON 832 - Public Finance
	FINC 850 – Financial Management
	SOCI 837: Criminology and Systems of Justice
	UAPP 616 - Volunteer Management (1 credit)
	UAPP 658 - Contemporary Issues in Public Administration (1 credit)
	UAPP 619 - Contemporary Issues in Urban Affairs and Planning (2 credits)
	UAPP 686 - State and Local Government: Concepts and Issues
	UAPP 687 -State Government Management and Policy

¹ All courses are 3-credit courses with a letter grade unless otherwise specified

² Accounting

³ Business Administration

Thematic Area	Class
Built and natural environment, and society	BREG ⁴ 628 - Natural Wastewater Treatment Systems
	CEIG 633 - Hazardous Waste Management
	CIEG 637 - Water and Wastewater Quality
	CIEG 650 - Urban Transportation Systems
	CIEG 654 - Urban Transportation Planning
	CIEG 655 – Civil Infrastructure Systems
	CIEG 667 – Resilience Engineering
	ENWC ⁵ 610 – Medical, Veterinary and Forensic Entomology
	ENWC 611 – Insect Pest Management
	ENWC 814 – Advanced Ecology
	GEOG 617 – Seminar in Climate Change
	GEOG 622 - Resources, Development and the Environment
	GEOG 649 - Environment and Society
	GEOL 621 - Environmental and Applied Geology
	MAST 601 - Introduction to Oceanography
	MAST 671 - Coastal Processes and Management
	PLSC ⁶ 603 – Soil Physics
	PLSC 608 – Environmental Soil Chemistry
	PLSC 619 – Soil Microbiology
	SOCI 671 - Disasters, Vulnerability & Development
	UAPP 675 - Land Use and Transportation Linkages (1 credit)

⁴ Department: Bioresources Engineering

⁵ Department of Entomology and Wildlife Ecology

⁶ Department of Plant and Soil Sciences

Thematic Areas	Class
Vulnerability and resilience	CIEG667 – Resilience Engineering
	CHEG 622 - Chemicals, Risk and the Environment
	FREC ⁷ 826 - Issues in Domestic and Foreign Rural Development
	GEOG 617 - Seminar in Climate Change
	GEOG 622 - Resources, Development and the Environment
	HLPR 809 - Health Behavior
	HLPR 823 - Human Response to Stress
	HLPR ⁸ 610 - Health and the Media
	HDFS 670 - Family Risk and Resiliency
	HDFS 870 - Prevention, Intervention and Policy
	MAST 692 - Environmental Values, Movements and Policy
	NURS 613 – Death Education
	POSC 844 - International Security
	SOCI 622 - Collective Behavior
	SOCI 661 - Racial Stratification
	SOCI 671 - Disasters, Vulnerability & Development
	UAPP 637 - Organizing for Social Justice (1 credit)
	UAPP 651 - Managing Risk and Society

⁷ Department: Food and Resource Economics

⁸ Program: Health Promotion

Thematic Areas	Class
Policy and planning	CIEG 654- Urban Transportation Planning
	GEOG 622 - Resources, Development and the Environment
	ECON 832 - Public Finance
	HLPR ⁹ 610 - Health and the Media
	MAST 670 - United States Ocean and Coastal Policy
	MAST 672 - Applied Policy Analysis (to coastal and ocean issues)
	MAST 692 - Environmental Values, Movements and Policy
	POSC 624 - Energy Policy and Administration
	POSC 838 - Public Policy Analysis
	POSC 818 - Environmental Policy and Administration
	SOCI 622 - Collective Behavior
	UAPP 602 - Introduction to Comprehensive Planning (1 credit)
	UAPP 603 - Introduction to Zoning and Land Use Controls (1 credit)
	UAPP 617 - Contemporary Issues in Environment and Energy Policy (1 credit)
	UAPP 657 - Health Policy

⁹ Program: Health Promotion

Thematic Areas	Class
Simulation and Modeling	BUAD 837 - Decision Support and Expert Systems for Business
	CISC 659 - Topics in Communication, Distributed Computing and Networks
	FREC ¹⁰ /STAT 608 – Statistical Research Methods
	FREC 682 – Spatial Analysis of Natural Resources
	GEOG 670 - GIS
	GEOG 671 - Advanced GIS
	HLPR 803 - Advanced Health Promotion Programming and Evaluation
	SOCI 611 - Techniques of Demographic Analysis
	ORES 603 Simulation Modeling and Analysis

¹⁰ Department of Food and Resource Economics

Thematic Areas	Class
Health Systems Leadership	HSAD 637 – Health Planning Strategies
	HSAD 638 – Health Services Evaluation
	NURS 6xx ¹¹ – Health Systems Disaster Leadership
	NURS xxx ¹² – Biological, Chemical, Radiological and Other Source Emergencies: Planning Response and Public Policy Measures

¹¹ Proposed new course

¹² Proposed new course

Appendix B. Methods Classes

These classes serve as methods classes for the PhD in Disaster Science and Management. A student entering the PhD with an MS in another field or from a different program should plan to take EDUC 665 – Elementary Statistics (or if appropriate UAPP704 Statistics for Policy Analysis) and UAPP 808 Qualitative Methods for Program Evaluation (or if appropriate EDUC 850 – Qualitative Research in Education) as the required 6 credits of methods classes. Other students should choose from this list.

CIEG 641 RISK ANALYSIS

Framework to understand, characterize, and support decision making involving risk. Specific engineering risk analysis concepts and methods, e.g., fault trees, event trees, Markov models, simulation. Focus on engineering perspective, but includes some discussion of interdisciplinary context. Applications to all areas of engineering. Many real-world case studies.

ECON877 ADVANCED BENEFIT-COST ANALYSIS

Concentrates on the identification and measurement of the benefits and costs of both market and non-market activities. Applies benefit-cost principles to realistic problems. Prerequisites: ECON551. Corequisites: ECON801.

MAST 664 DECISION TOOLS FOR POLICY ANALYSIS

Develops quantitative decision-making skills for science and technology policy decisions. Covers decision-making under uncertainty, axioms of decision analysis, decision trees, influence diagrams, sensitivity analysis, confidence intervals, value of information, probabilistic risk assessment, and multi-attribute decision theory. May be cross-listed with POSC663 and/or UAPP663.

APEC601 SURVEY OPERATIONS RESEARCH I

Covers various deterministic mathematical programming methods (LP, integer dynamic), network models and basic inventory models. Prerequisites: Linear algebra.

APEC602 SURVEY OPERATIONS RESEARCH II

Covers various stochastic operations research models including decision theory, game theory, project planning, inventory models, simulation, Markov decision processes and Queuing models. Prerequisites: Linear algebra and MATH630.

APEC603 SIMULATION MODELING AND ANALYSIS

Instructors from hard sciences and social sciences introduce real-world Operations Research case studies based on their expertise. Students implement proposed solution methodologies using a variety of available computer software packages. Prerequisites: ORES601 and permission of director/instructor. Corequisites: ORES602.

OPERATIONS RESEARCH APPLICATIONS

Applications of models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queueing theories, maintenance and replacement of equipment and government planning. Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems.

Corequisites: MATH529, STAT601 or MATH630.

POSC816 PHILOSOPHY OF SCIENCE AND RESEARCH DESIGN Provides advanced training in philosophy of science and research design. Intended to provide students with the training and skills necessary to design dissertation proposals and write dissertations..

SOCI607 DATA COLLECTION AND ANALYSIS

A survey of methods and techniques for defining research problems and for gathering and analyzing data in sociological research.

STAT800 ESTIMATION AND STATISTICAL INFERENCE I

Selected topics in estimation and inference such as uniformly most powerful tests, uniformly most powerful unbiased tests, similarity and completeness, sufficiency, likelihood ratio tests, invariant tests, permutation test.

Prerequisites: STAT602, MATH602.

UAPP691 QUANTITATIVE ANALYSIS IN PUBLIC AND NONPROFIT SECTORS

Study of basic research design and data analysis techniques stressing applications in the public and nonprofit sectors. Includes research design, data acquisition, measurement, descriptive statistics, data collection, probability, exploratory data analysis, hypothesis testing, simple and multiple regression, correlation, and graphical procedures.

UAPP704 STATISTICS FOR POLICY ANALYSIS

Advanced training in applied multivariate regression for social and health science research. Topics: OLS review, limited dependent variables: various Logit and Probit models, Count Data Models, Selection and Truncated Models (Heckman, Tobit and Censored Models), Longitudinal Modeling (Panel Data, Multi-level Analysis, Survival Analysis).

UAPP808 QUALITATIVE METHODS FOR PROGRAM EVALUATION

Provides skills and examines issues in use of qualitative methods in context of program evaluation. Qualitative design, sampling approaches, data collection, and analysis included.

UAPP 827 PROGRAM AND PROJECT ANALYSIS (cost-benefit analysis).

Explores the ways in which decision-makers in the public sector evaluate the feasibility of government programs and projects through the application of Cost-Benefit Analysis

(CBA), Cost Utility Analysis (CUA), and Cost Effectiveness Analysis (CEA). Focuses on the determination of social costs and social benefits of public policies.

Prerequisites: UAPP834 or comparable course in public economics and permission of instructor.

Appendix C. Sample Plans of Study - PhD

Student Entering MS or PhD Directly from Undergraduate Program

Year	Fall	Winter	Spring	Summer
1	DISA 650 Overview of Disaster Science and Management (3) EDUC 665 Elementary Statistics (3) Elective I (3) DISA 680 Seminar (1)		DISA 670 Issues in Disaster Response (3) DISA 651 Int Comp Anal of Disasters (3) UAPP 808 Qualitative Methods for Program Evaluation (3) DISA 680 Seminar (1)	Internship
2	UAPP 698 – Decision Making (3) Elective II (3) DISA 869 Thesis (3) DISA 680 Seminar (L)		Elective III (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	Qualifier Internship
3	Specialization 1 (3) Research Methods III (3) DISA 680 Seminar (1)	Present Proposal	Specialization 2 (3) Research Methods IV (3) DISA 680 Seminar (1)	
4	Elective IV (3) Research 1 (3) DISA 680 Seminar (1)		Elective V (3) Research 2 (3) DISA 680 Seminar (L)	
5	Research 3 (3) Thesis (3) DISA 680 Seminar (L)		Thesis (6) DISA 680 Seminar (L)	

Student Entering with MS from Complementary Area (e.g. Civil Engineering or Political Science)

Assumes no background in Disaster Science and Management

Year	Fall	Winter	Spring	Summer
1	DISA 650 Overview of Disaster Science and Management (3) EDUC 665 Elementary Statistics (3) UAPP 698 – Decision Making (3) DISA 680 Seminar (1)		DISA 670 Issues in Disaster Response (3) DISA 651 Int Comp Anal of Disasters (3) DISA 680 Seminar (1)	Qualifier Internship
2	Specialization 1 (3) Research Methods III (3) DISA 680 Seminar (1)	Proposal	Specialization 2 (3) Research Methods IV DISA 680 Seminar (L)	Internship
3	Elective 1 (3) Research 1 (3) DISA 680 Seminar (L)		Elective 2 (3) Research 2 (3) DISA 680 Seminar (L)	
4	Research 3 (3) Thesis (3) DISA 680 Seminar (L)		Thesis (6) DISA 680 Seminar (L)	

A civil engineer specializing in Built and Natural Environment and Society might take the following classes:

- Specialization 1 – CIEG 655 Civil Infrastructure Systems
- Specialization 2 – CIEG 667 Resilience Engineering
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 816 Philosophy of Science and Research Design
- Elective 1 – SOCI 671 - Disasters, Vulnerability & Development
- Elective 2 – GEOG 670 – Geographic Information Systems

A political scientist specializing in Organization Management and Leadership might take the following classes:

- Specialization 1 – UAPP 686 State and Local Government: Concepts and Issues
- Specialization 2 – UAPP 687 State Government Management and Policy
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 816 Philosophy of Science and Research Design
- Elective 1 – ECON 801 – Microeconomic Theory

- Elective 2 – ECON 832 – Public Finance

Student Entering with MS from Another Program

Assumes some background in Disaster Science and Management

Year	Fall	Winter	Spring	Summer
1	UAPP 698 – Decision Making (3) Research Methods III (3) Specialization 1 (3) DISA 680 Seminar (1)		DISA 651 Int Comp Anal of Disasters (3) Research Methods IV Specialization 2 (3) DISA 680 Seminar (1)	Qualifier Internship
2	Elective 1 (3) Research 1 (3) DISA 680 Seminar (1)	Proposal	Elective 2 (3) Research 2 (3) DISA 680 Seminar (:L)	
3	Research 3 (3) Thesis (3) DISA 680 Seminar (L)		Thesis (6) DISA 680 Seminar (L)	

A student specializing in Vulnerability and Resilience might take the following classes:

- Specialization 1 – SOCI 671 - Disasters, Vulnerability & Development
- Specialization 2 – CIEG 667 Resilience Engineering
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 816 Philosophy of Science and Research Design
- Elective 1 – UAPP 651 – Managing Risk and Society
- Elective 2 – GEOG 670 – Geographic Information Systems

Or a student specializing in Continuity of Operations might take the following classes:

- Specialization 1 – CIEG 654 –Urban Transportation Planning
- Specialization 2 – POSC 818 – Environmental Policy and Administration
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 816 Philosophy of Science and Research Design
- Elective 1 – ECON 801 – Microeconomic Theory
- Elective 2 – ECON 832 – Public Finance

Or a student specializing in Simulation and Modeling might take the following classes:

- Specialization 1 – GEOG 671 – Advanced GIS
- Specialization 2 – SOCI 611 – Techniques of Demographic Analysis
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 816 Philosophy of Science and Research Design
- Elective 1 – STAT 608 – Statistical Research Methods
- Elective 2 – Independent study in decision support systems

E. Assessment of library resources available to support the graduate program as provided by the UD Library



University of Delaware Library

OFFICE OF THE INTERIM VICE PROVOST
& DIRECTOR OF LIBRARIES

181 South College Avenue
Newark, DE 19717-5267
Phone: 302-831-2231
Fax: 302-831-1046

October 19, 2015

Memorandum

To: Sue McNeil
Professor, Department of Civil and Environmental Engineering
Program Director, Disaster Science and Management

From: Sandra Millard *Sandra Millard*
Interim Vice Provost and Director of Libraries

I am responding to your request to supply information about the capability of the University of Delaware Library to support permanent status for the Graduate Programs in Disaster Science and Management.

The University of Delaware Library with its strong interdisciplinary and electronic collections is well able to support this graduate program. Enclosed is a description of collections, resources and services available for this purpose.

I would be pleased to respond to any questions.

SM/nb
Enclosure

c: Department of Civil and Environmental Engineering
Harry Shenton, III, Professor and Chair

University of Delaware Library
Susan Davi, Associate Librarian, Head, Collection Management
and Licensed Electronic Content Department
M. Dina Giambi, Associate University Librarian for Technical Services and Resource Management
Erin Daix, Associate Librarian, Collection Management
and Licensed Electronic Content Department



October 19, 2015

Report on Library Services and Collections in Support of
Permanent Status for the Graduate Programs in Disaster Science and Management

General Description

The University of Delaware Library includes the Hugh M. Morris Library, where the main collection is housed; two branch libraries located on the Newark campus, the Chemistry Library and the Physics Library; and a third branch library, the Marine Studies Library, located in Lewes, Delaware. The Library collections parallel the University's academic interests and support all disciplines. The Graduate Programs in Disaster Science and Management are directly supported by the Library's strong collections in agriculture and natural resources, applied economics and statistics, civil engineering, climatology, criminal justice, economics, environmental studies, geography, geology, public health, health policy, operations research, water science, sociology, psychology and public policy.

Books, full-text electronic journals and electronic books, databases, periodicals, microforms, government publications, maps, manuscripts and media provide a major academic resource for the University of Delaware, the surrounding community, the state of Delaware and the nation. Library staff members provide a wide range of services.

The University of Delaware Library is a U.S. depository library and a U.S. patent depository library and contains the complete file of every patent issued by the U.S. Office of Patents and Trademarks.

The online catalog, DELCAT Discovery, provides access to millions of items by author, title, subject and keyword.

Library collections number over 2,800,000 and are broadly based and comprehensive. In 2014/2015, the Library Web <library.udel.edu/> received over 2,200,000 virtual visits.

Specific Support for the Graduate Programs in Disaster Science and Management

The Library's collections are strong and are well able to support this graduate program. In addition to direct support for disaster research, the Library has, for many years, supported related graduate and undergraduate programs in public policy, sociology, natural resources, environmental studies, civil engineering, criminal justice, climatology, economics, statistics and geography. The collections in these areas are excellent and continue to grow. Funds are designated at the beginning of each fiscal year for the support and strengthening of the collections

An experienced librarian, Erin Daix, Associate Librarian, Collection Management and Licensed Electronic Content Department, serves as the Library liaison to the faculty in the Disaster Science and Management

Program. As Library liaison, Ms. Daix works with the Disaster Science and Management Program to:

- Further develop Library collections, both print and electronic, to support the teaching, learning and research needs of the Disaster Science and Management Program
- Provide research support for faculty and students in a consultation setting
- Provide instruction in a classroom setting
- Serve as a resource for the information needs of faculty and students in this program as they relate to the Library, Scholarly Communication, Open Access and other topics

Library liaisons have developed and maintain 250 research guides <guides.lib.udel.edu/> in all subject areas. These research guides direct students to a wide array of useful resources including databases, eJournals, eBooks, reference materials, visual material and more. In this context, Ms. Daix maintains a research guide for Disaster Studies, as well as guides for Sociology, Anthropology and Criminal Justice. Research guides in the areas of Public Policy and Administration, Engineering and Technology, Environmental and Earth Sciences, and Health Sciences are also available. Ms. Daix is also available to work with faculty to develop research guides for specific courses within this program.

In addition to its extensive print-based collections, the Library provides access to more than 70,000 electronic journals <library.udel.edu/ejournals/> and 440,000 electronic books <library.udel.edu/ebooks/>. Within the Library's eJournal collection, the social sciences and sciences are particularly strong, including almost all the journals published by Elsevier, Springer, Wiley, Sage, and Taylor and Francis as well as smaller publishers such as Oxford University Press, Cambridge University Press, Annual Reviews, and the American Psychological Association. Within the eBook collection, online access to all books published by Springer from 2010-present and all books published by National Academies Press are of particular importance.

The Library subscribes to 370 online databases <library.udel.edu/databases/> which support research in all areas. Among the most important databases for study and research in disaster science and management are: *ASTM Standards and Digital Engineering Library*, *Business Source Premier*, *Compendex*, *Criminal Justice Abstracts*, *EconLit*, *GeoRef*, *GREENR (Global Reference on the Environment, Energy and Natural Resources)*, *GreenFILE*, *Environmental Sciences and Pollution Management*, *Meteorological and Geostrophysical Abstracts*, *Sociological Abstracts*, *Policy Map*, *PsycINFO*, *PAIS International*, *PubMed*, *Scopus*, *Statistical Insight*, and *Web of Science*.

UDSpace, the Library's institutional repository, provides access to the Disaster Research Center's research in digital form, including more than 700 DRC preliminary papers, final project reports, annual reports, presentations, and working papers. This material is freely available to all researchers and scholars throughout the world.

The Library also subscribes to *RefWorks*, a web-based citation management tool that can be used with most databases.

Sue McNeil
October 19, 2015
Page 3

The Library has strong collections of film and video <library.udel.edu/filmandvideo/> which support study and teaching in all subject areas.

The Library has a nationally recognized Student Multimedia Design Center <library.udel.edu/multimedia/> which provides access to equipment, software and training related to the creation of multimedia projects. The Student Multimedia Design Center includes over 80 workstations, six studios and two classrooms focused on multimedia creation. University of Delaware users also may borrow a wide variety of multimedia equipment. Through its Multimedia Literacy program, the Student Multimedia Design Center provides instructional support for faculty seeking to incorporate multimedia into their assignments.



Sandra Millard
Interim Vice Provost and Director of Libraries

F. Self study report

1. General information about the program:

a. Brief introduction and history of the program - include dates.

In the summer of 2006, Provost Rich established the Committee for a Graduate Program in Disaster Science and Management. The purpose of the committee was to explore program options, building on the existing programs and research in the Disaster Research Center (DRC). The committee developed a proposal for a new interdisciplinary graduate program in Disaster Science and Management, offering an MS degree (including both a “with thesis” and a “without thesis” option) and a PhD. The program was approved by the Faculty Senate in April 2009. Seed funding (\$400,000) was obtained through Unidel¹. The first students entered the program in Fall 2010. The complementary relationship with DRC has been key in establishing this program.

b. Explain how the program is compatible with the academic priorities of the University.

Consistent with “Delaware Will Shine” strategic initiative the Disaster Science and Management program is committed to excellence and consequentiality. We emphasize learning, scholarship and engagement through classroom instruction, research, field work and professional development. Our program is consistent with the guiding principles defining what we value:

- Delaware First – Through the School of Public Policy and Administration we provide tuition scholarships to Delaware residents.
- Diversity – Our racially, ethnically, geographically and culturally diverse student body adds to the learning environment and contributes diverse perspectives to the research.
- Partnership – Our partnerships range from individuals to agencies to professional organizations to companies to other units across campus. Whether as guest lecturers, providers of training courses, opportunities to participate in training exercises, or internship and research project opportunities, our partners are critical to our success and we have established a wide variety of working relationships.
- Engagement – Disaster preparedness, response, recovery and mitigation impacts individuals, communities, businesses and society as whole. As a grand challenge, disasters require knowledge, tools, and cultural sensitivity that transcends disciplinary boundaries.
- Impact – Our research is widely cited and used by the emergency management community. Our graduates have been placed in positions in emergency

¹ These resources were used to provide support for teaching core courses and graduate student support for the first year. Full tuition was paid for supported students although no financial returns the program were realized.

management organizations and academic institutions. In our original proposal, we stated that we expect our graduates to be the “stewards of the discipline”. They are indeed serving in this role.

- c. Explain how the program will help students meet the general education requirements of the University, specifically the ten (10) general education goals for undergraduate education (please note that this section applies only to undergraduate programs).

Not applicable

- d. Curricular requirements, including fulfillment of University, college and departmental requirements.

The Master of Science in Disaster Science and Management (**Non-Thesis Option**) requires 30 credits including 24 credits of graduate level coursework, 2 semesters of seminar (2 semesters at 1 credit per semester and additional semesters as a listener), and 4 credits of practicum. The 24 credits of coursework are specified in each student’s plan of study and must include:

- Three core courses (9 credits):
 - DISA 650 - Overview of Disaster Science and Management
 - DISA 651 - International Comparative Analysis of Disasters
 - DISA 670 - Issues in Disaster Response
- Research Methods/Analysis Courses (3 credits):
 - EDUC 665 - Elementary Statistics, or
 - UAPP 808 - Qualitative Methods for Program Evaluation, or if appropriate
 - UAPP 704 - Statistics for Policy Analysis, or
 - EDUC 850 - Qualitative Research in Education
- Public Policy and Organizational Decision Making (3 credits):
 - UAPP 698 – Management Decision Making for Public and Non-Profit Sectors (3 credits) ²or
 - MAST 663 - Decision Tools for Policy Analysis (3 credits)
- Elective Courses: (9 Credits).
- Other requirements are:
 - DISA 680 - Disaster Science and Management Seminar (1 credit) Taken two semesters for credit, additional semesters as a listener
 - DISA 857 - Practicum (1-3 credits) A one credit course in the spring semester is followed by a 3 credit summer internship. Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc.
 - Study abroad is also strongly encouraged.

The Master of Science in Disaster Science and Management (**Thesis Option**) requires 30 credits including 21 credits of graduate level coursework, 4 semesters of seminar (2 semesters at 1 credit

² Course number and name has changed to: UAPP 684 -- Performance Management and Program Evaluation

per semester and 2 semesters as a listener), 1 credit of practicum, and 6 credits of thesis. The 21 credits of coursework are specified in each student's plan of study and must include:

- Three core courses (9 credits):
 - DISA 650 - Overview of Disaster Science and Management
 - DISA 651 - International Comparative Analysis of Disasters
 - DISA 670 - Issues in Disaster Response
 - Research/Methods/Analysis Courses (6 credits):
 - Quantitative Methods
 - EDUC 665 - Elementary Statistics, or if appropriate
 - UAPP 815 - Public Management Statistics
 - Qualitative Methods
 - UAPP 808 - Qualitative Methods for Program Evaluation, or if appropriate
 - EDUC 850 - Qualitative Research in Education
 - Public Policy and Organizational Decision Making (3 credits):
 - UAPP 698 - Management Decision Making for Public and Non-Profit Sectors³ (3 credits) or
 - MAST 663 - Decision Tools for Policy Analysis (3 credits)
 - DISA 680 - Disaster Science and Management Seminar (1 credit) Taken four semesters – two semesters for credit, two semesters as a listener
 - DISA 857 - Practicum (1 credit) One-credit internship course in spring semester, followed by the summer internship (no credit). Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc. The practicum can also be substituted by a research project at DRC.
 - Study abroad is also strongly encouraged.
 - Thesis (6 credits)
 - Elective Course: (3 Credit).
- e. Results of assessments or evaluations regarding the quality of the program - must indicate policies and procedures, how the assessment was used, and how the program changed because of it. What has the program accomplished in order to enhance assessment, particularly focusing on student learning outcomes?

The learning goals for the MS degree are manifest in the requirements for the degree. They are measured directly in the courses through various mechanisms that include: course papers, oral presentations; project reports and final examinations. In the non-thesis MS degree, the internship requires the student to put their classroom learning in context and is evaluated by the program director and the supervisor from the organization through a brief report. In the MS degree with thesis, the thesis is evaluated by a faculty committee as described in the Program Policy Statement.

³ Course number and name has changed to: UAPP684-- Performance Management and Program Evaluation

In addition to these direct measures of the program, every year graduating students are informally interviewed to identify strengths and weaknesses of the program. Given the small class size we have not implemented a formal exit survey as it would not be anonymous. We also informally interact with our graduates and seek feedback on a continuous basis. The results of these discussions, class evaluations, and committee evaluations of theses are used to modify the program and our approach to its delivery. For example, we have adjusted course assignments in order to evaluate and enhance a student's knowledge and skills related to understanding and implementing the research process and effectively critiquing the literature.

f. What are the department/unit's strategies for student advisement?

We only admit students to the program if a faculty member is willing to serve as an advisor. Once admitted we then reinforce the need for students to interact with their advisor to select courses, develop a plan of study and then a research proposal (if applicable). Our program places a high premium on mentorship and student development. The plan as spelled out in the program policy statement is as follows:

Applications are circulated to faculty in an effort to match the student with an advisor. Faculty members advise students whose background, goals and objectives are compatible with their own research and funding. The Program Committee arrives at an admission decision after reviewing the completed application. To be admitted a student must have an advisor.

Students are required to work with their advisor during their first semester of study and develop a plan of study. The plan of study must first be approved by the advisor and then by the Program Committee by the end of the first semester of study for the MS or PhD.

The student and his/her advisor will create a thesis/dissertation committee at the time the student begins to develop the thesis/dissertation proposal.

The thesis/dissertation defense will be scheduled only after the advisor of the thesis/dissertation committee has determined that a defense is appropriate.

Advising responsibilities have been embraced by the faculty. Table 1 shows the distribution of responsibilities.

Table 1 Advising Responsibilities Fall 2015

Advisor	MS
Aguirre	0
Davidson	0
Kendra	1
McNeil	2
Trainor	5
Wachtendorf	1

In addition the graduate seminar (DISA 680) and the required practicum class (DISA 857) introduce skills, expose students to career options, and provide opportunities to practice public speaking and for professional development. Professional development sessions (rotated over a two year schedule) include:

- Giving presentations
- Writing a literature review
- Writing an abstract
- Submitting a journal paper
- Responding to paper reviews
- Writing a resume
- Using the library
- Using the DRC resource collection
- Ethical considerations in disaster research
- Human subjects and Institutional Review
- Writing research proposals.

The student chapter of the International Association of Emergency Managers also provides training sessions on topics ranging from quick response research training to mass casualty incidents.

- g. If applicable, specify if the program meets all accreditation requirements (e.g., ABET, AACSB, APA, CADE etc.).

Not applicable.

- h. Report any changes in the program admission criteria, degree requirements, or subject areas since the program was initiated.

- Admission criteria
 - Submitted 2013, approved 2014

Changed “A recommended GRE score of 1050 on math and verbal sections combined” to “GRE scores in the sixty-fifth percentile or better for the verbal section and fiftieth percentile or better for the quantitative section, and a score of 4.0 or above on the analytical section are recommended.”

- Degree requirements
 - Submitted 2012, approved 2013:

A new core course, DISA 670 - Issues in Emergency Response, is proposed for the MS program. This course substitutes for POSC 656 - Politics of Disaster which is no longer taught due to a retirement.

DISA 857 - Practicum was changed to DISA 867 - Practicum to be consistent with numbering systems used by other units. This change was made in the course approval process in 2010 but not updated in the program policy statement.

UAPP 808 - Qualitative Methods for Program Evaluation was substituted for EDUC 850 - Qualitative Research in Education as the UAPP - 808 will now be taught on a regular basis and this is the more appropriate course.

Course number and name changes:

New	Old
DISA 651 International Comparative Analysis of Disasters	DISA 651 International Aspects of Disasters
DISA 857 Practicum	DISA 867 Practicum
UAPP 698 Management Decision Making	UAPP 819 Management Decision Making
UAPP 704 Statistics for Policy Analysis	UAPP 815 Public Management Statistics
GEOG 670 Geographic Information Systems	GEOG 667

Courses that were no longer offered have been eliminated.

CIEG 641 Risk Analysis was added to the list of methods classes.

- Subject areas
 - None
- i. General description of recruiting procedures - include any information for underrepresented populations.

Most of our graduate students find the program through one of three mechanisms. The first is word of mouth – their undergraduate professors, a practitioner, or a DRC alumni recommends the program. The second is from the Federal Emergency Management Agency’s Emergency Management Institute Higher Education Program website, “The College List” (<https://www.training.fema.gov/hiedu/collegelist/>). The third is the DRC and SPPA websites. The School of Public Policy and Administration also runs open houses for prospective graduate students that we participate in. The program director and individual faculty regularly respond to emails directly received from prospective students.

2. Student information:

- a. Application and enrollment history - provide a tabular summary or graphical representation by year showing numbers of applicants, offers, matriculated,

graduated, and dropped out (this data must be confirmed by the Admission's Office, the Registrar's Office, the Office of Graduate Studies or the Office of Institutional Research and Planning, as appropriate).

The enrollment history is shown in Table 2. Figure 1 shows the yield for admitted students and matriculated students as a percentage of applicants. We attract a relatively small number of applicants but in general these applicants are well qualified for the program. The yield in terms of the number that matriculate into the program fluctuates significantly. Figure 2 shows the cumulative number of students admitted, graduating and withdrawing from the program. Figure 3 shows the number of students enrolled and graduated each year. The number of students graduating will decline in the coming years to reflect the lower intakes of new students. The large intake in 2012 stretched our capacity for advising beyond a reasonable level.

As shown in Table 2, the last two years has shown a significant decline in the number of applicants. This is largely influenced by the capacity of the faculty to advise and fund students. As shown in Figure 3 the enrollment peaked in 2013 and the faculty were overwhelmed with the responsibility of advising these (and PhD) students. We have not actively recruited a lot of students as we do not have the capacity to advise or fund them. Many prospective applicants that we interact with do not apply when they realize that it is highly unlikely that they will get funding during their first year or these are more interested in a training program for emergency managers. However, given current resources we will need to actively recruit MS students for 2016 to maintain program enrollments at 10-12 students.

Table 2 Enrollment History

Year		2010	2011	2012	2013	2014	2015
Applicants		10	20	21	19	15	7
Admitted		7	15	15	13	13	5
Matriculated		5	4	10	5	3	2
Dropped out			1	1			
Funded		3	2	1	0	0	1
Grads	Total	1	2	3	5	7	1 ⁴
	Thesis	0	1	2	2	4	1
	Non-Thesis	1	1	1	3	3	

⁴ As of October 1, 2015.

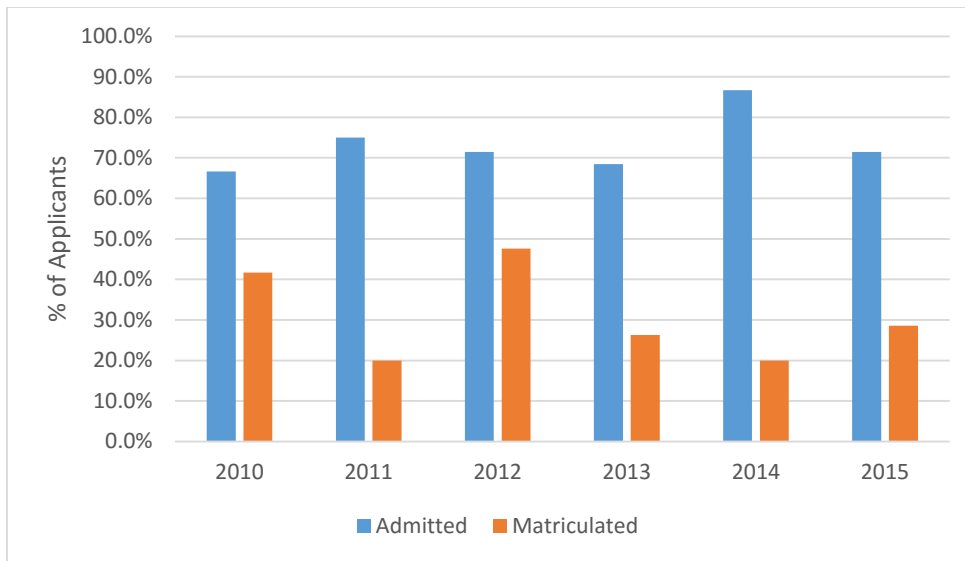


Figure 1 Yield from DISA MS Applications

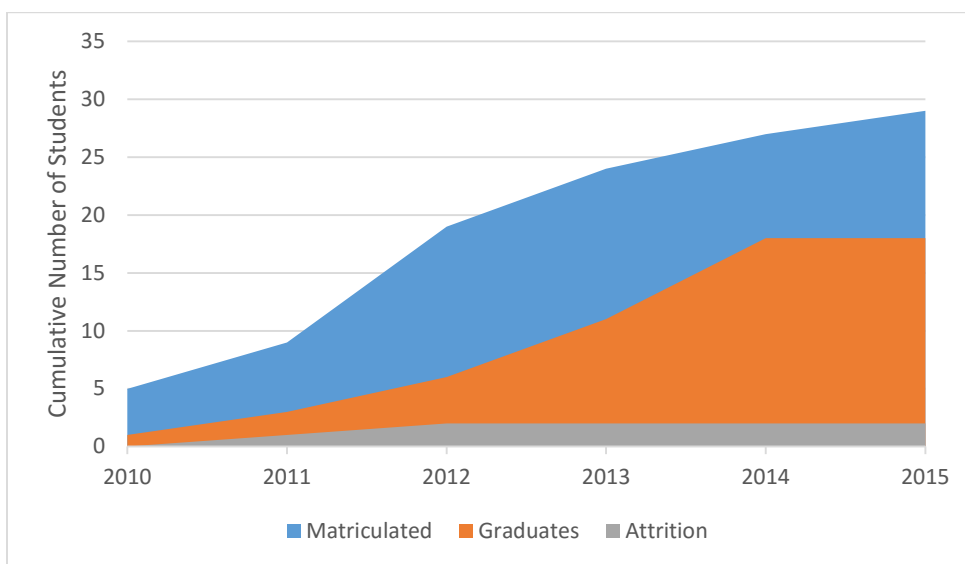


Figure 2 Cumulative Number of Students

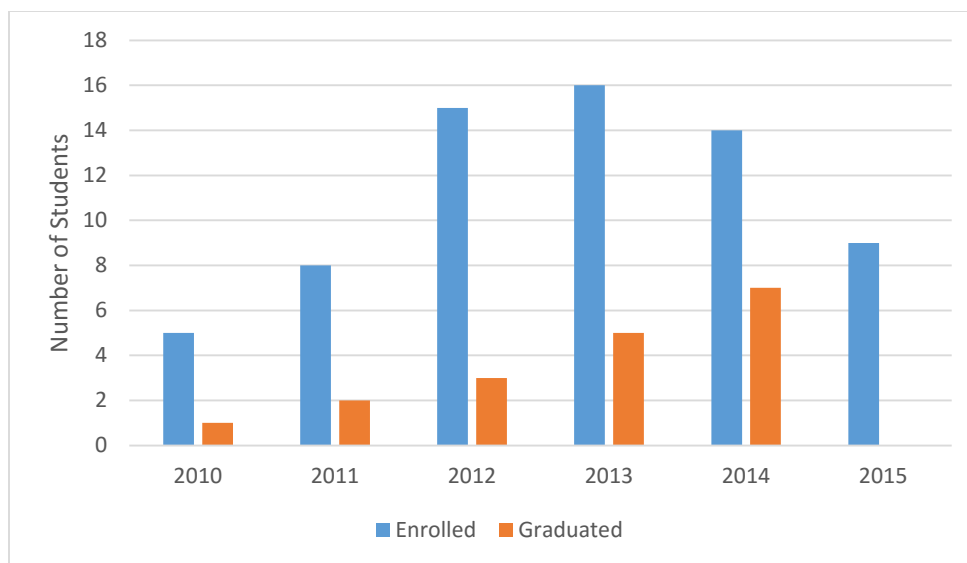


Figure 3 Enrollment and Graduation History

- b. Annotated evidence of placement for students who have graduated - indicate how the department facilitates placement.

Table 3 lists the placement of MS graduates. In addition, three MS graduates have continued to a PhD in the DISA program, one has entered the PhD in Geography at University of Delaware and one has entered a PhD program at another university. Figure 4 shows a breakdown of our graduates by sector. Equal numbers of graduates work for government, work in the private sector, or have pursued further education.

All MS students take a 1 credit practicum course, DISA 857. The course is taught by a current or former practitioner. This course covers resume writing and interviewing skills and introduces the student to organizations and individuals who may offer internship and employment opportunities.

For students in the non-thesis option the internship provides a perspective on opportunities. For thesis students, they often interact with practitioners and agencies in the course of their research.

The faculty also receive notices of positions and these are circulated to all students via an email distribution. We encourage all students to review these notices so they get a sense of the types of positions available. We have also developed a guidance sheet with information on how to approach the job market based on feedback from practitioners and our graduates' experiences.

Table 3 Placement of MS Graduates

Placement of MS Students
Operations Associate, International Services, Red Cross, Washington DC
Computer Game Developer
Emergency Dispatcher, Fairfax County, Va / Consultant
Emergency Management, City of Berkeley, CA
Kentucky Emergency Management
Staff Engineer, Applied Research Associates, Vicksburg, MS
Emergency Management Project Coordinator at California Resiliency Alliance
State Oceanic Administration of China
Freelance Project Management
Science Writer, I.M. Systems Group Inc. supporting NOAA and their NESDIS Communications Team
Disaster Recovery Outreach Communications Coordinator in Central Jersey under the Americorps and New Jersey Volunteer Organizations Active in Disasters (NJVOAD) programs
Fire Marshall, Aramco, Saudi Arabia
Delaware Department of Public Health
United Nations Intern

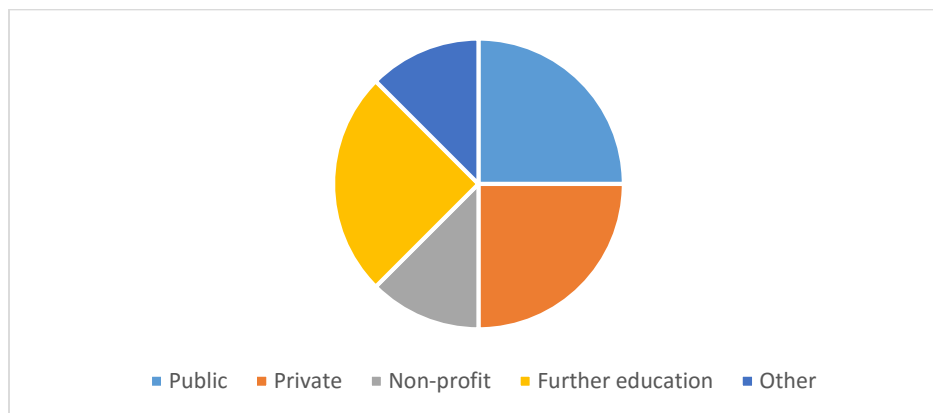


Figure 4 Number of Graduates by Employment Sector

Some of our students are supported by their employers and are required to return to their positions on completion of their degree. For example, we have had two Fulbright students funded for their MS degrees and they have been required to return to their positions and their home countries.

Finally, we strongly encourage students to participate in disaster-related events, conferences, workshops and exercises to help build their professional networks. Students with papers or posters accepted at conferences or workshops are eligible for professional development funding through the graduate office and several have taken advantage of this resource.

- c. Identify sources and levels of financial support for students in the graduate program and indicate the proportion receiving assistantships*.

Graduate financial support comes in four different forms:

- i. Tuition scholarships are awarded by SPPA
(http://www.sppa.udel.edu/content/graduate_tuition)
- ii. Graduate research assistantships come from projects. Most assistantships are awarded through the Disaster Research Center and are externally funded projects usually based on an award following the successful submission of a competitive proposal. Some students are also able to find funds through other centers and programs.
- iii. University Graduate Scholars and University Graduate Fellows – these competitive awards are based on evidence of academic merit and academic achievement, cultural status and need.
- iv. External funding. Examples include companies, Fulbright fellowships, and educational scholarships from the student's home country.

In general first year MS students rarely receive funding other than the tuition scholarship, unless they find a research assistantship in another department or have external funding. Table 4 summarizes the sources of support for MS students, indicating that the majority of students are self supporting. However, these students do receive modest tuition scholarships.

Table 4 Sources of Support for MS Students

Source of Support	2010	2011	2012	2013	2014	2015
Company	0	0	0	1	1	0
Fulbright	0	0	1	2	1	0
Graduate Scholar	0	1	1	0	0	0
Legislative Fellow	0	0	0	1	0	0
Research Assistant	2	3	4	3	4	3
Self Supported	3	4	8	8	8	6
Teaching Assistant	0	0	1	1	0	0
Total	5	8	15	16	14	9

3. Identify demand and competitive factors in the region, nationally or internationally for attracting students - explain how this benefits and/or challenges the program.

The DISA program is unique. It is not a training program but a research grounded, academic, rigorous MS program. The purpose of the program is to provide students with the intellectual ability to understand, create, integrate, and apply sophisticated discipline-specific and

interdisciplinary knowledge to disaster preparedness, response, recovery and mitigation. Recognizing that the discipline continues to evolve, students are expected to acquire the vocabulary and critical thinking skills to evaluate and produce future knowledge. Toward these ends, the following goals for graduate student learning are presented. We expect our students to:

- Demonstrate breadth and depth of knowledge in the discipline
- Effectively communicate knowledge in the discipline
- Demonstrate the ability for critical and analytical thinking in the discipline
- Exhibit the best practices, values, and ethics of the profession
- Apply knowledge of the discipline

Events such as Hurricane Sandy continue to highlight the importance of disasters; and ten years after Hurricane Katrina, we are still seeing applicants that became interested in disasters through a volunteer experience in New Orleans.

The major benefit of the program is that we are graduating students that we can be proud of. They work hard and they have knowledge and skills that will serve them and the communities in which they work well.

The challenges largely lie in communicating what the MS degree involves to prospective students. Some students want a training program, others find the program too rigorous and the expectations of the faculty too demanding. Some students find that the program is financially beyond their available resources. Some students are drawn to the area without any real knowledge of what Disaster Science and Management entails.

4. Identify factors that make this program unique or distinctive compared to similar programs at other institutions.

The MS in Disaster Science and Management at University of Delaware is unique because of the tight connections between course content and research. One of our recent graduates posted the following comment to Facebook: “That moment when you're perusing spontaneous volunteer management documents for work only to come across multiple citations from at least 5 of your former UD Disaster Research Center professors/affiliated scholars...” Furthermore, the interdisciplinary focus encourages the students to develop critical thinking skills and the breadth needed to address disasters. We complement the course content with strong advising, and opportunities for field experience.

5. Overview of interdisciplinary relationships (if any) - include trends on what students choose for electives.

The DISA MS program is an interdisciplinary degree. Core courses in methods are selected from a variety of courses throughout the university. Many students take EDUC 850 - Elementary Statistics to meet the quantitative methods requirement. Students seeking more advanced quantitative methods classes have taken SOCI 605 - Data Collection and Analysis or CIEG 641 - Risk Analysis. Qualitative methods requirements are typically met by EDUC 850-- Qualitative Research in Education, SOCI 606 - Qualitative Methodology, or UAPP 808 - Program Evaluation.

Students are required to take a decision tools class, either UAPP 698 – Management Decision Making for Public and Non-Profit Sectors / UAPP 684-- Performance Management and Program Evaluation, or MAST 663 - Decision Tools for Policy Analysis.

Popular elective classes for MS students include:

- BUAD 870 Leadership and Organizational Behavior (5 students)
- GIS classes (GEOG 667 , GEOG 670 - Geographic Information Systems and Science, GEOG 671 - Advanced Geographic Information Systems, GEOG 673 - Select Technical Topics, and UAPP 652 - Geographic Information Systems in Public Policy) (11 students)
- Sociology (SOCI 667 - Seminar, SOCI 671 - Disasters Vulnerability and Development) (8 students)
- UAPP 697 - Leading Organizations in the Profit and Non-Profit Sectors (7 students)

However students have also taken classes a wide variety of classes in the School of Public Policy and Administration (UAPP), Marine Policy, Energy and Environmental Policy, Civil Engineering and other Geography classes, as well as additional methods classes as electives.

Furthermore, a number of students from other programs take our core courses as shown in Table 5. These students include undergraduates, and Civil Engineering, Sociology and School of Public Policy and Administration graduate students. It is expected that the numbers of students from the MPA program in SPPA will increase with the adoption of the concentration in Disaster and Emergency Management.

Table 5 Percentage of Non-DISA Students in Classes

	F10	S11	F11	S12	F12	S13	F13	S14	F14	S15
DISA650	50.0%		50.0%		29.4%		14.3%		45.5%	
DISA651		42.9%		12.5%		36.4%		27.3%		57.1%
DISA667			0.0%	0.0%		23.1%				
DISA670								NA		57.1%

6. Characterize whether the facilities available for this program are adequate to support student, faculty, and staff needs.

Although the DISA program has no decided space or facilities, we benefit from the affiliation with the Disaster Research Center. In particular the DRC Resource Collection is a valuable resource and access to the DRC conference room as a meeting room for IAEM, colloquium presentations, thesis and dissertation proposals and defenses and as a classroom for special research training is valued.

3. Provide information on other budgetary requirements of the program beyond the typical unit expenses.

Current resources are adequate to maintain a steady state of about 25-30 students in the MS and PhD programs. However growing the program requires additional commitments to research assistantships, and additional faculty. Additional faculty are critical to provide advising and to bring in research projects that in turn will provide research assistantships.

4. Other information of value for the review of the program.

We are very proud of our MS students. They have participated in field research (see Table 6), volunteered their time to support disaster recovery, been active participants in the student chapter of the International Association of Emergency Managers at University of Delaware, and undertaken a wide variety of internships (see Table 7). They have disseminated the results of their research through papers (1), posters (5) and conference presentations (11). They have won prestigious scholarships and professional development awards (see Table 8). They have written theses on timely and relevant topics as shown in Table 9. They have sought and found positions in relevant organizations where they are making a difference.

Table 6 MS Student Participation in Field Studies

Date	Location
July 2013	Oklahoma (Tornado)
November 2012 and ongoing	New York and New Jersey (Hurricane Sandy)
October/November 2011	Tohoku, Japan (Earthquake and Tsunami)
February 2012	Tohoku, Japan (Earthquake and Tsunami)
August 2011	Mineral, VA (Earthquake)

Table 7 MS Student Internships

Dates	Organization	Location
Spring 2011	American Red Cross of the Delmarva Peninsula	Wilmington DE
Summer 2012	Applied Research Associates (ARA)	Raleigh NC

Spring 2013	Sussex County Emergency Operations Center	Georgetown DE
Spring 2013	University of Delaware Department of Public Safety	Newark DE
Summer 2013	Delaware Emergency Management Agency	Smyrna DE
Fall 2013	University of Delaware Office of Emergency Management	Newark DE
Fall 2013	San Francisco Emergency Management Agency	San Francisco CA
Summer 2014	New York City of Emergency Management (OEM)	New York, NY
Fall 2014	Willow Spring Towing and Recovery	Chantilly, VA

Table 8. MS Student Awards

2013-2014	Anne Goodman	<ul style="list-style-type: none"> • Great Lakes National Scholarship
	Jennifer Lazo	<ul style="list-style-type: none"> • First place in the poster competition at the IAEM meeting in Reno, October 2013.
2012-2013	Erik Archibald	<ul style="list-style-type: none"> • “Homeland Security: Trusting The Public” Finalist in Center For Homeland Defense & Security essay competition, May 31, 2013.
	Jennifer Lazo	<ul style="list-style-type: none"> • SPPA Director’s Citation • Third place in the Student Poster Competition at the International Association of Emergency Managers (IAEM) Conference on October 30, 2012, in Orlando, Florida
2011-2012	Erick Archibald	<ul style="list-style-type: none"> • UD-UTC Graduate Fellowship

Table 9 MS Theses

1. Johnson, Mei, "An Analysis of Two After-Action Reports Published by the Tennessee Valley Authority Following the 2008 Kingston Coal Fly Ash Slurry Spill in Kinston, Tennessee," Master of Science, Disaster Science and Management, September 2015.
2. Francis, Zephi, "'Tornado Safety Education in Public Schools,'" Master of Science, Disaster Science and Management, May 2015.
3. Jahan, Israt, "Assessment of Long Term Housing Recovery after Hurricane Sandy," Master of Science, Disaster Science and Management, May 2015.
4. Al-Rashed, Hamed, "How Consistent are Emergency and Disaster Measurements and Scales?" Master of Science, Disaster Science and Management, May 2015.
5. Yoder-Bontrager, Daryl, "Nongovernmental organizations in disaster and coordination: A complex adaptive systems view," Master of Science, Disaster Science and Management, August 2014.
6. Goodman, Anne, "Applying the Individual Understanding and Response Framework to Sea-Level Rise South of Delaware's Indian River Inlet," Master of Science, Disaster Science and Management, August 2014.
7. Liu, Chunjing, "Measuring Social Vulnerability of Chinese Coastal Counties to Natural Hazards," Master of Science, Disaster Science and Management, May 2014.
8. Lazo, Jennifer, "Framing Disasters Planning for People with Disabilities: Analyzing the Calif v City of Los Angeles Lawsuit," Master of Science, Disaster Science and Management, August 2013.
9. Wilson, Eva, "Lessons Learned the Hard Way: Incident Comment System Learning and Training," Master of Science, Disaster Science and Management, August 2013.
10. Greer, Alex, "Oil Spill Events: Prominent Frames and Policy Implications," Master of Science, Disaster Science and Management, August 2012.

G. Appendices for supporting documentation

1. Original application for provisional approval.

PROPOSAL FOR AN INTERDISCIPLINARY PROGRAM IN DISASTER SCIENCE AND MANAGEMENT

January 25, 2009

1 Mission Statement/ Description/ Executive Summary

The proposed Disaster Science and Management (DISA) program is an interdisciplinary graduate course of study offering master's and doctoral degrees. The programs cover the theories, research methodologies, and policies informing efforts focused on emergency preparedness, mitigation, management, and response.

The objective of the proposed programs is to educate Disaster Science and Management professionals, researchers, and educators at the graduate level. The programs include a core curriculum, electives, research opportunities and internships.

The program builds on the unique strengths and international reputation of the Disaster Research Center (DRC) and other related programs and research at the University of Delaware. Ongoing research includes vulnerability and resiliency of social and physical systems, social and public policies for disaster reduction, and analysis and management of infrastructure systems.

The program will involve faculty from all colleges at the University of Delaware and foster sustained partnerships with federal, state, and regional agencies, such as the Federal Emergency Management Agency (FEMA) and Delaware Emergency Management Agency (DEMA) to support student research and internships.

2 Market Assessment

2.1 Context

2.1.1 *Compatibility with the University of Delaware Mission*

The program is consistent with the central mission of the University of Delaware to cultivate both learning and the free exchange of ideas. By providing a targeted academic program in an area of national importance, and a well-structured responsive program tied to opportunities for research funding, the program addresses three of the four academic priorities in the area of graduate education:

- successful students
- high-quality, affordable programs
- superior research and service

More relevant is the fact that the program is consistent with the University's strategic, plan "Path to Prominence."

2.1.2 *Description of the Planning Process*

This proposal was developed by the Committee for a Graduate Program in Disaster Science and Management, a group of thirteen faculty representing all colleges at the University of Delaware. The committee was chaired by Sue McNeil (Civil and

Environmental Engineering and Director of the Disaster Research Center) and the members are Burt Abrams (Economics), Benigno Aguirre (Sociology and DRC), James Corbett (Marine and Earth Studies), Tracy DeLiberty (Geography), Russell Dynes (DRC), Debra Hess Norris (Art Conservation), Joann Nigg (Sociology and DRC), Havidan Rodriguez (Provost's Office and DRC), Rick Sylves (Political Science), Jeff Raffel (CHEP), Eric Rise (Criminal Justice), Tom Sims (Agriculture and Natural Resources), and Jim Richards (Health Sciences). The committee met regularly between 2006 and 2008 to develop an outline for a new program. Meetings included an analysis of strengths, weaknesses, opportunities, and threats (SWOT) related to disaster studies and a careful review of relevant existing courses and alternate administrative structures. Committee members examined existing graduate programs in disaster studies nationally, met with potential employers and prospective students, and conducted a full-day work session to develop the draft program policy statement.

Draft copies of the proposal were circulated to interested faculty, administrators, and external experts, and two lunch-time meetings were held with faculty and administrators from potential cooperating departments and centers in April 2007. Comments and suggestions were gathered and incorporated into the final proposal. We also met with graduate students at the Disaster Research Center, the 2007 NSF REU students at the DRC, the Sociology and Criminal Justice faculty, and the School of Urban Affairs and Public Policy (SUAPP) faculty. In addition, we presented a poster at the Annual Natural Hazards Workshop in Boulder, Colorado. During the fall 2008 semester discussions were also help with the College of Human Services, Education and Policy ad hoc Methods Committee and the proposal revised to include existing rather than new methods classes.

The MS and PhD programs in Biomechanics and Movement Science served as an interdepartmental prototype. This program places emphasis on the plan of study and selecting an advisor at the application stage. We have also placed emphasis on the plan of study and the need for the student to have an advisor to be admitted to the program.

2.1.3 Impact on Other University Programs

Impact on other university programs will be minimal. There are three programs with graduate students currently working in areas related to disasters: 1) Sociology and Criminal Justice, 2) Environmental and Energy Policy, and 3) Civil and Environmental Engineering.

Other programs that could be perceived as impacted by the proposed program are Marine Policy, Business Administration, Political Science, and Urban Affairs and Public Policy. Only the Program in Environmental and Energy Policy explicitly has a concentration in disasters – specifically Disasters and Public Policy.

In each case, these programs are discipline specific. For example, students interested in disasters and sociology will still enroll in the graduate program in Sociology and Criminal Justice. The existing programs attract students interested in the discipline who

have an interest in disasters. In contrast, the proposed program is aimed at students who wish to focus on disasters and **not** on a specific discipline.

2.1.4 Utilization of Existing Resources

The proposed program builds on relevant courses and ongoing research at the University of Delaware. The core courses include four existing courses: one from Political Science (POSC656 The Politics of Disaster), two from Education (EDUC665 Elementary Statistics, and EDUC850 Qualitative Research in Education), and one from Urban Affairs and Public Policy (UAPP819 Management Decision Making). Professor Sylves from Political Science who currently teaches POSC656 has started the UD On-Line Fellows Program to add a distance learning component to POSC656 Politics and Disaster. Numerous electives have been identified from among the existing graduate course offerings (These courses are listed in the Program Policy Statement). These courses are also electives in other departments, and enrollment will not place an undue burden on the instructors or departments.

2.2 Student Demand and Targeted Student Populations

Students may enroll full-time or part-time. However, the PhD program has a residency requirement of two full continuous semesters. Entry to the PhD program also requires a master's degree.

2.3 Transferability

We are not anticipating many transfer students. As admission to the program requires the commitment of an advisor, transfers will be reviewed on a case-by-case basis.

2.4 Graduate / Professional Program Access

Not applicable

2.5 Demand and Employment Factors

Graduates will be sought by state and local agencies, as well as consulting firms and academic institutions. Representatives of government organizations interviewed indicated that they have a need for graduates of programs such as ours. An informal review of online job opportunities revealed numerous opportunities that could outstrip our resources to support and advise students. Examples of positions available in October 2007 include the following:

Academic Positions

- Purdue University – Department of Building Construction Management
- SUNY Albany – Department of Public Administration & Policy
- University of Wisconsin-Green Bay – Department of Public and Environmental Affairs
- Texas A&M – Corpus Christi - Public Administration
- University of Colorado, Boulder – Natural Hazards Center (Program Manager)

- Louisiana State University – Stephenson Disaster Management Institute (SDMI), E. J. Ourso College of Business (2 Postdoctoral Researchers, 1 or more Assistant/Associate/Full Professor)
- Missouri State University – Department of Political Science
- Shaw University – Emergency Management

Public Sector

- San Francisco Bay Area Super Urban Area Security Initiative – Regional Planner Positions
- City and Country of Denver – Emergency Management Coordinator
- City of Chicago – Project Manager (Office of Emergency Management & Communications) – Local Preparedness Initiatives and Exercises, and Project Manager-Regional Planning (Office of Emergency Management & Communications)
- North Central Texas Council of Governments – Interns
- Maryland Department of Health & Mental Hygiene – Director, Office of Emergency Preparedness and Response
- Medical & Health Research Association of New York City (MHRA) – Training Coordinator
- The Congressional Research Service – Analyst in American National Government
- FEMA - Civil Engineers, and Insurance Program Specialist

NGOs

- Red Cross of Greater New York (Senior Coordinator, Mass Care & Sheltering, and Assistant Director, Drills & Exercises)

Consultants

- Booz Allen – Emergency Management Subject Matter Expert
- ICF – Emergency Management Exercise Planning Specialist

2.6 Regional/State/ National Factors

While related efforts are ongoing at institutions throughout the U.S., our proposed program is unique in its focus and in its integration of education and research. Department of Homeland Security Centers, such as the Center for the Study of Preparedness and Catastrophic Event Response (PACER) at The Johns Hopkins University and the Center for Risk and Economic Analysis of Terrorism Events at the University of Southern California, focus on research and have only peripheral involvement in education. On the other hand, the NSF-funded Earthquake Engineering Research Centers (MCEER, PEER, etc.) and the Natural Hazards Center at University of Colorado at Boulder emphasize particular types of disasters and are not degree granting programs while they do have an educational component. The FEMA Emergency Management Institute (EMI) in Emmitsburg, Maryland, promotes college-based emergency management education for future emergency managers and other interested personnel. EMI also provide a list of academic programs (<http://training.fema.gov/EMIWeb/edu/collegelist/>). While we believe there are no programs comparable to the proposed program, we include a short list to illustrate some of the differences:

- Master of Public Administration with a concentration in Emergency Management, University of North Texas (36-42 hours, no thesis) <http://www.padm.unt.edu/mpa/index.php/current/degree>
- Master's of Science in Emergency Management, Millersville University (30 credit hours, no thesis) <http://www.millersville.edu/~msem/curriculum.php>
- Ph.D. in Urban and Regional Science (URSC) and **Master of Urban Planning (MUP)** (48 credit hours with thesis) with a concentration in Hazard Planning and Emergency Management offered by the Department of Landscape Architecture and Urban Planning at Texas A&M <http://archone.tamu.edu/hrrc/Education/>
- MS (45 credit hours including a thesis) and PhD degrees in Emergency Management are offered in the Department of Sociology, Anthropology and Emergency Management at North Dakota State University <http://www.ndsu.edu/instruct/kulmer/socanth/graduate/index.htm>
- Disaster Science and Management at Louisiana State University offers a graduate minor <http://dsm.lsu.edu/graduate-minor.htm>
- MS in Fire and Emergency Management, Political Science Department, Oklahoma State University, <http://polsci.okstate.edu/graduate/femp/> (39 credit hours including practicum)

2.7 Accrediting / Professional Mandates

Not applicable

2.8 Other Strengths

The proposed program builds on the broad base of interdisciplinary research conducted by the Disaster Research Center, the over 660 field studies taken by the DRC, the interest indicated by more than 42 faculty from six different colleges who contributed to lunch-time discussions about the program and indicated their interest in participating in the program, and the national and international reputation of the University of Delaware for work related to disasters.

3 Enrollments, Admissions and Financial Aid

3.1 Enrollment Limitations/ Criteria

The number of students accepted each year will depend upon the funding available, faculty research, and faculty resources for advising. This will be balanced against the need to ensure a cohort of students that form a critical mass. The cohort forms the core population for the required classes and facilitates the student-centered management of the program. Table 1 presents enrollment projections based on the anticipated resources, interest in the program, and the concept of developing a cohort of students. Table 2 shows similar projections for the maximum number of students we believe we can accommodate and the minimum number of students needed to have a viable program.

3.2 Admission Requirements/ Criteria

Admissions decisions will be made by the Program Committee of the Disaster Science and Management Program. Students will be admitted to the program based on enrollment availability, identification of an appropriate and committed advisor, and their ability to meet the following minimum recommended entrance requirements.

Table 1. Enrollment Projections – Realistic Case

Program	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
MS Yr 1 Professional	5	10	15	20	20
MS Yr 2 Professional		5	10	15	20
MS Yr 1 Research	5	5	5	5	5
MS Yr 2 Research		5	5	5	5
Total MS	10	25	35	45	50
PhD Yr 1	2	2	2	2	2
PhD Yr 2		2	2	2	2
PhD Yr 3			2	2	2
PhD Yr 4				2	2
Total PhD	2	4	6	8	8
Total Students	12	29	41	53	58
Number of Graduates	0	10	15	22	27

Table 2. Maximum and Minimum Enrollment Projections

Minimum Number of Students	Program	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
	MS Yr 1 Professional	3	3	3	3	3
	MS Yr 2 Professional		3	3	3	3
	MS Yr 1 Research	3	3	3	3	3
	MS Yr 2 Research		3	3	3	3
	Total MS	6	12	12	12	12
	PhD Yr 1	1	1	1	1	1
	PhD Yr 2		1	1	1	1
	PhD Yr 3			1	1	1
	PhD Yr 4				1	1
	Total PhD	1	2	3	4	4
	Total Students	7	14	15	16	16
	Number of Graduates	0	6	6	7	7
Maximum Number of Students	Program	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
	MS Yr 1 Professional	10	15	20	30	40
	MS Yr 2 Professional		10	15	20	30
	MS Yr 1 Research	10	10	10	10	10
	MS Yr 2 Research		10	10	10	10
	Total MS	20	45	55	70	90
	PhD Yr 1	4	4	4	4	4
	PhD Yr 2		4	4	4	4
	PhD Yr 3			4	4	4
	PhD Yr 4				4	4
	Total PhD	4	8	12	16	16
	Total Students	24	53	67	86	106
	Number of Graduates	0	20	25	34	44

Applicants to the MS program must have

- A baccalaureate degree from an accredited college or university.
- A recommended GRE score of 1050 on math and verbal sections combined
- An undergraduate GPA of 3.0 or higher
- A written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his or her professional objectives.

Applicants to the PhD Program must have

- An MS or equivalent degree from an accredited college or university.
- A recommended GRE score of 1050 on math and verbal sections combined
- A graduate GPA of 3.5 or higher.
- A written statement of goals and objectives (the personal statement) that clearly identifies the applicant's research and curriculum interests and explains how admission to the program will facilitate his or her professional objectives.

All students are also expected to demonstrate competence in oral and written communication. Knowledge of mathematics and statistics is strongly encouraged. All admitted students will have an advisor.

3.3 Transfer Policy

Not applicable

3.4 Retention Policy

Not applicable

3.5 Student Expenses and Financial Aid

3.5.1 Extraordinary Expenses

No extraordinary expenses are anticipated.

3.5.2 Sources of Financial Support

Students in the professional master's track are expected to be self-supporting although some scholarship support will be provided to seed the program. Student loans will be available through the usual channels. More importantly, we will work with employers and government agencies to encourage them to provide tuition for their employees. A limited number of scholarships or tuition remissions should be available when the program is launched to help market the program.

We anticipate supporting most students in the research track on graduate research assistantships provided by external grants through the faculty advisors. Students will also be encouraged to compete for University and external fellowships. We also believe that a limited number of international students will be attracted to the program with their own funding. Part-time students will provide their own funding.

4 Curriculum Specifics

4.1 Degrees Awarded

- Master of Science in Disaster Science and Management
- Doctor of Philosophy in Disaster Science and Management

4.2 Curriculum

The **Master of Science in Disaster Science and Management (non-thesis option)** requires 30 credits including 24 credits of graduate level coursework, 4 semesters of seminar (2 semesters at 1 credit per semester and 2 semesters as a listener), and 4 credits of practicum. The 24 credits of coursework for the **Master of Science in Disaster Science and Management** are specified in the student's plan of study and must include the following:

Three core courses (9 credits):

DISA 650 – Introduction to Disasters/Historical Aspects of Disasters

POSC 656 – The Politics of Disaster/Public Policy Aspects of Disasters

DISA 651 – International Aspects of Disasters/Development/Comparative Analysis

Research/Methods/Analysis Course (3 credits):

EDUC 665 – Elementary Statistics, or

EDUC 850 – Qualitative Research in Education

(or if appropriate UAPP 815 Public Management Statistics, or UAPP 808 Qualitative Methods for Program Evaluation)

Public Policy and Organizational Decision-Making (3 credits):

UAPP 819 – Management Decision Making for Public and Non-Profit Sectors (3 credits), or

MAST 663 – Decision Tools for Policy Analysis (3 credits)

Seminars (2 credits):

DISA 680 - Disaster Science and Management Seminar (1 credit)

Taken four semesters – two semesters for credit, two semesters as a listener,

Internship (4 credits):

DISA 867- Practicum

A one credit course in the spring semester is followed by a 3 credit summer internship. Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc. Study abroad is also strongly encouraged.

Elective Courses (9 credits).

The **Master of Science in Disaster Science and Management (thesis option)** requires 30 credits including 24 credits of graduate level coursework, 4 semesters of seminar (2 semesters at 1 credit per semester and 2 semesters as a listener), 1 credit of practicum, and 6 credits of thesis. The 24 credits of coursework for the **Master of Science in Disaster Science and Management** are specified in the student's plan of study and must include the following:

Three core courses (9 credits):

DISA 650 – Introduction to Disasters/Historical Aspects of Disasters

POSC 656 – The Politics of Disaster/Public Policy Aspects of Disasters
 DISA 651 – International Aspects of Disasters/Development/Comparative Analysis
Research/Methods/Analysis Courses (6 credits):
 EDUC 665 – Elementary Statistics (or if appropriate UAPP815 Public Management Statistics)
 EDUC 850 – Qualitative Research in Education (or if appropriate UAPP 808 Qualitative Methods for Program Evaluation)
Public Policy and Organizational Decision-Making (3 credits):
 UAPP 819 – Management Decision Making for Public and Non-Profit Sectors (3 credits), or
 MAST 663 – Decision Tools for Policy Analysis (3 credits)
Seminars (2 credits):
 DISA 680 - Disaster Science and Management Seminar (1 credit)
 Taken four semesters – two semesters for credit, two semesters as a listener,
Internship (1 credit):
 DISA 867- Practicum
 Spring course is followed by the summer internship (no credit). Students could do internships with DEMA, FEMA, other DHS Offices, United Nations, USAID, etc.
 The practicum can also be substituted by a research project at DRC. Study abroad is also strongly encouraged.
Thesis (6 credits)
Elective Courses (3 credits).

The **Doctor of Philosophy in Disaster Science and Management** requires 42 credits of graduate-level coursework beyond the master's degree including 9 credits of dissertation. Students are expected to choose a thematic area such as one of the following:

- Organizations, management, and leadership – focus on management and leadership in all phases of a disaster. Includes knowledge of institutional structures and tools to support decision making.
- Built and natural environment, and society – focus on the interfaces among the three infrastructures (built, natural and social) with an emphasis on the opportunities to control, influence, accommodate, and understand changes and needs during and after catastrophic events.
- Vulnerability and resilience – focus on how systems are impacted by and respond to catastrophic events. Includes how systems can be modified or adapted to reduce vulnerability and improve resilience.
- Policy and planning – focus on response to disasters including continuity of operations.
- Simulation and modeling – focus on decision support tools and the modeling of impacts to support disaster planning, mitigation, response, and recovery.
- Health systems leadership: public health disaster planning and response – focus on the role of health professionals and systems in planning for and responding to disasters.

The 42 credits of coursework for the **Doctor of Science in Disaster Science and Management** are specified in the individual planned program of study, and must include the following:

Courses from a thematic area listed above (at least 9 credits)

Research methods (qualitative or quantitative) (at least 6 credits):

EDUC 665 – Elementary Statistics

EDUC 850 – Qualitative Research in Education (or UAPP 808 Qualitative Methods for Program Evaluation)

ECON877 - Advanced Benefit-Cost Analysis

MAST664 - Decision Tools for Policy Analysis

ORES601 - Survey Operations Research I

ORES602 - Survey Operations Research II

ORES603 - Simulation Modeling and Analysis

ORES801 - Optimization Models and Methods

ORES802 - Operations Research Applications

POSC816 - Advanced Social Research for Political Science

SOCI607 – Data Collection and Analysis

STAT800 - Estimation and Statistical Inference I

UAPP 815 – Public Management Statistics

UAPP816 – Advanced Social Statistics

UAPP 827 - Program and Project Analysis (cost-benefit analysis).

PhD Dissertation in the thematic area (9 Credits)

Seminar (3 credits)

Students must register for and attend three semesters of seminar (DISA 680).

Students are expected to participate in seminar as a listener for other semesters that they are on campus.

Electives (15 credits)

Electives are intended to enhance and broaden a student's scholarly involvement in the program. Students in the doctoral degree program are allowed to take a maximum of 6 credits of independent study (DISA 866) and a maximum of 9 credits of research (DISA 868). However, the combined number of credits from research and independent study courses may not exceed 12.

4.3 Sample Curriculum

A sample program of study for the Master's of Science in Disaster Science and Management (non-thesis option) full-time is shown in Table 3.

An alternative plan of student for Master of Science in Disaster Science and Management (non-thesis option) completed in one year is shown in Table 4.

A sample program of study for the Master's of Science is shown in Table 5.

A sample plan of study for a student entering the MS and PhD programs directly from an undergraduate program is shown in Table 6.

Table 3. Plan of Study for MS (non-thesis option).

Fall – Year 1	Spring – Year 1	Summer
DISA 650 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) Elective I (3) DISA 680 Seminar (1)	POSC 656 The Politics of Disaster (3) DISA 651 Int. Aspects of Disasters (3) DISA 867 Practicum (1) DISA 680 Seminar (1)	DISA 867 Practicum (3)
Fall Year 2	Spring – Year 2	
UAPP 819 – Management Decision Making (3) Elective II (3) Elective III (3) DISA 680 Seminar (L)		

L = Listener, Total 30 credits

Table 4. One-Year Plan of Study for MS (non-thesis option)

Fall	Spring	Summer
DISA 650 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) Elective I (3) DISA 680 Seminar (1) UAPP 819 – Management Decision Making (3)	POSC 656 The Politics of Disaster (3) DISA 651 Int. Aspects of Disasters (3) DISA 867 Practicum (1) DISA 680 Seminar (1) Elective II (3) Elective III (3)	DISA 867 Practicum (3)

L = Listener, Total 30 credits

Table 5. Plan of Study for MS (Thesis Option)

Fall – Year 1	Spring – Year 1	Summer
DISA 650 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) Elective I (3) DISA 680 Seminar (1)	POSC 656 The Politics of Disaster (3) EDUC 665 – Elementary Statistics (3) DISA 867 Practicum (1) DISA 680 Seminar (1)	UNIV 554 Internship
Fall Year 2	Spring – Year 2	
UAPP 819 – Management Decision Making (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	DISA 651 Int. Aspects of Disasters (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	

L = Listener
Total 30 credits

Table 6. MS and PhD Plan of Study

Year	Fall	Spring	Summer
1	DISA 650 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) Elective (3) DISA 680 Seminar (1)	POSC 656 The Politics of Disaster (3) DISA 651 Int. Aspects of Disasters (3) EDUC 665 – Elementary Statistics (3) DISA 867 Practicum (1) DISA 680 Seminar (1)	UNIV 554 Internship
2	UAPP 819 Decision Making (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	Elective (3) DISA 869 Thesis (3) DISA 680 Seminar (L)	Qualifier UNIV 554 Internship
3	Specialization 1 (3) Research Methods III (3) DISA 680 Seminar (1)	Specialization 2 (3) Research Methods IV (3) DISA 680 Seminar (1)	
4	Elective IV (3) Research 1 (3) DISA 680 Seminar (1)	Elective V (3) Research 2 (3) DISA 680 Seminar (L)	
5	Research 3 (3) Thesis (3) DISA 680 Seminar (L)	Thesis (6) DISA 680 Seminar (L)	

5 Resources Available

5.1 Learning Resources

The MS program will be supported by excellent print and electronic resources available for the study of disasters through the Morris Library and the E.L. Quarantelli Resource Collection housed at the Disaster Research Center. A letter from the Director of Libraries verifying support is included in Appendix D.

The E. L. Quarantelli Resource Collection at the Disaster Research Center (DRC) serves as a repository for materials relating to the field of disaster research produced by a wide range of institutions and researchers. The Center's collection contains the world's oldest and most complete set of documents on the social and behavioral aspects of disasters. One of the Collection's unique strengths is its highly specialized content, which includes significant unpublished papers, conference presentations, older government reports, and declassified information. The Collection now numbers more than 55,000 items and is open to both interested researchers and agencies involved in emergency management and related areas. The Center also produces its own book, monograph, and report series, copies of which can be found in the Collection. These, combined with copies of preliminary papers and articles produced by DRC staff members, total over 850 publications generated by the DRC. The Resource Collection has one full-time Resource Collection Coordinator and the support of an undergraduate student for 12–15 hours per

week. Funding for personnel and material support for the Collection comes entirely from gifts.

5.2 Faculty/ Administrative Resources

The program will reside in the College of Human Resources, Education and Public Policy (CHEP) in the School of Urban Affairs and Public Policy (SUAPP). The SUAPP faculty have voted on the program and a letter from the director is included in Appendix B indicating unanimous support for the program assuming appropriate resources.

The program will be administered by a Program Director, a Program Committee, and other committees (seminar and PhD qualifier). The Program Director will be a faculty member appointed by the Dean of the College where the program resides. The Program Committee is modeled after the Program Committee in Biomechanics and Movement Science (BIOMS). The Program Committee will be selected from among the faculty affiliated with the program. Faculty who have indicated that they are interested in being affiliated with the program are listed in Appendix F.

5.3 External Funding

The Disaster Research Center currently supports nine research assistants from Sociology on externally research projects. It is anticipated that many of these funding lines will continue to support the current graduate students from Sociology and, where appropriate, new graduate students in Sociology. However, DRC faculty along with colleagues in Civil and Environmental Engineering are actively pursuing research funding in interdisciplinary areas. In addition, the University Transportation Center at the University of Delaware (UDUTC) focuses on *resiliency of transportation corridors* and currently supports one student working on disasters. It is likely that the UDUTC will be able to fund at least one student each year. Other sources of funding include resources that faculty from other programs bring to the program, self-funded international students, and external fellowships.

6 Resources Required

6.1 Learning Resources

No new learning resources are needed to implement the proposed program.

6.2 Faculty/Administrative Resources

While the proposed program involves an enthusiastic group of existing faculty, these faculty have responsibilities in their home departments. Therefore, we are requesting 5 FTEs on the following basis:

- Program Director – 0.4 FTE
- Program Committee – 0.6 FTE (6 members at 0.1 FTE each on the basis of administered workload)
- New Courses – 2.0 FTEs (assuming between 5 and 7 new courses)
- Advising PhD and MS students and guiding dissertations and theses – 2.0 FTE

Faculty recruiting will require active collaboration with departments that are interested in supporting the proposed program and are willing to explore joint appointments,

synergistic relationships, and opportunities to leverage existing resources. We seek faculty hires in areas that are consistent with the thematic areas and the teaching needs of the proposed graduate program. Suggested areas as they relate to disasters include the following:

- Emergency management (for example, preparedness, response and recovery)
- Economics, finance and business
- International aspects of disasters
- Evacuation, supply chain management and logistics, or systems engineering
- Spatial analysis and geographic information systems
- Public health or epidemiology.

An International Advisory Board will be assembled to provide advice to the program. The Board will meet annually.

An administrative assistant is also required to support the program. The administrative assistant's responsibilities will include

- Processing graduate student applications including application review and admissions
- Completing graduate research assistant appointments
- Scheduling visits of graduate applicants
- Helping with graduate student recruitment
- Helping to identify internships
- Assisting with student placement
- General program administration including
 - Matching students to internships
 - Scheduling and providing logistics support for meetings of the program committee, the seminar meeting, the PhD Qualifier Committee, the International Advisory Board, and thesis and dissertation defenses.

We will also need resources for graduate recruiting, including website development, minimal support for campus visits for prospective graduate students, travel support for recruiting graduate students at conferences, and administrative supplies.

6.3 Budgeting Needs:

In addition to the faculty and administrative resources, initial resources are needed to attract, recruit, and support graduate students. Eventually, it is anticipated that most graduate assistantships and fellowships will come from external research contracts and grants and from internal and external competitive graduate fellowship programs. As the program becomes more established, we expect that participating faculty will have developed new research initiatives. We also plan to work with development to find scholarship and fellowship funding that will be available to the professional students. Table 7 lays out a plan for funding research assistants and providing limited scholarship opportunities for professional students. As the table indicates, we are requesting four research assistantships to initiate the program in the first year and then seven research assistantships in the second year. In subsequent years, due to external funding increases we expect the commitment from the university to diminish.\

Table 7. Potential Research Assistant Funding Plan

	Number of students	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013
MS (Thesis Option) and PhD	Total Students	7	14	16	18	18
	Funding Sources					
	DRC	1	3	5	7	8
	UTC	1	1	1	1	1
	Other Sources	1	3	5	7	9
	Total funds	3	7	11	15	18
	Gap	4	7	5	3	0
MS (Non_thesis Option)	Total Students	5	15	25	35	40
	Scholarships	2	3	2	1	0

7 Implementation Plan and Evaluation

7.1 Implementation

Once the graduate program is approved by the various University committees and the Faculty Senate and resources have been identified, a Program Committee will be assembled, and applications will be solicited for the 2009-2010 academic year. We have already received several informal inquiries.

7.2 Evaluation Plan

The normal University of Delaware process will be to give the new program temporary status. Review for permanent approval will be scheduled for five years after the startup of the program. The review procedure for the program will follow standard UD review protocol for M.S. programs. The proposed International Advisory Board will also provide feedback and advice on recruiting, retaining, and placing students; new sources of research funding; and interactions with other organizations.

Appendices

A. Accreditation Plan

Not applicable

B. Letters of Collaborative Agreement

College of Agriculture and Natural Resources

College of Business Administration

College of Marine and Earth Studies

Department of Business Administration

Department of Civil and Environmental Engineering

Department of Sociology and Criminal Justice

Professional and Continuing Studies

School of Nursing

University Libraries



OFFICE OF ACADEMIC
PROGRAMS AND RESEARCH

113 Townsend Hall
University of Delaware
Newark, Delaware 19716-2103
Ph: 302/831-2501
Fax: 302/831-6758

October 25, 2007

TO: Dr. Sue McNeil
Department of Civil and Environmental Engineering
Director, University of Delaware Disaster Research Center

FROM: Dr. Tom Sims 
Associate Dean, College of Agriculture and Natural Resources

SUBJECT: Proposed Graduate Program in Disaster Science and Management

The College of Agriculture and Natural Resources wishes to express its strong support for the proposed new inter-disciplinary graduate program in Disaster Science and Management. We believe the program is well-constructed and offers an exciting opportunity for faculty and students in our college to collaborate with others at the University of Delaware on research and teaching in an area of worldwide critical importance. Our faculty expertise in the agricultural and environmental sciences is highly relevant to understanding and managing natural and human-induced disasters and we look forward to participating actively in this program in the future.

Thank you.

cc: Dean Robin Morgan, College of Agriculture and Natural Resources
CANR Department Chairs



ALFRED LERNER COLLEGE OF BUSINESS AND ECONOMICS

OFFICE OF THE DEAN

303 Alfred Lerner Hall
University of Delaware
Newark, Delaware 19716-2701
Ph: 302/831-2551
Fax: 302/831-6750
www.lerner.udel.edu

TO: Sue McNeil
FROM: Bobby Gempesaw *Bobby Gempesaw*
DATE: November 11, 2008
RE: Proposed Graduate Program in Disaster Science & Management

On behalf of the Lerner College of Business and Economics, I write to support the proposed graduate program in Disaster Science and Management.

This proposed interdisciplinary degree program builds on the work of the Disaster Research Center and provides an opportunity to engage faculty from other departments and colleges in disaster research and education. We look forward to having students from the program in our courses in the Lerner College of Business and Economics.



October 18, 2007

MEMORANDUM

TO: Sue McNeil, Professor
FROM: Nancy M. Targett, Dean *Nancy M. Targett*
SUBJECT: Proposed Graduate Program

On behalf of the College of Marine and Earth Studies, I write to support the proposed graduate program in Disaster Science and Management.

Such a program is timely, and, it is my belief that the well regarded, multi-disciplinary Disaster Research Program is an excellent host for it. Faculty from the College of Marine and Earth Studies can be expected to make significant contributions by advising students who are interested the broad science and policy aspects of coastal resiliency and vulnerability.

You have my strong support as you move forward with this well-thought-out degree program.

Sue McNeil

From: Andrews, Rick [andrews@lerner.udel.edu]
Sent: Monday, October 29, 2007 11:50 AM
To: Sue McNeil
Subject: Graduate Program in Disaster Science and Management

October 29, 2007

Professor Sue McNeill
Department of Civil and Environmental Engineering
360D Dupont Hall

Dear Professor McNeill:

I would like to voice my support for the proposed Graduate Program in Disaster Science and Management.

At present two of our graduate courses, BUAD 870 (Understanding People in Organizations) and BUAD 880 (Marketing Management) would lend themselves nicely to the program, are offered frequently and have seats available for graduate students in the proposed program. BUAD 837 (Decision Support and Expert Systems for Business), provides another possible course, but it has not been offered in quite some time.

I look forward to working with you in the future. Please let me know if you have questions about other BUAD courses that could possibly be used in the program. Best wishes in getting the new program approved.

Rick Andrews

*Dr. Rick L. Andrews
Professor of Marketing and Department Chair
Department of Business Administration
Lerner College of Business & Economics
University of Delaware
Newark, DE 19716
Phone: (302) 831-1190
Fax: (302) 831-4196
Website: <http://www.buec.udel.edu/andrews/>*



COLLEGE OF ENGINEERING

DEPARTMENT OF
CIVIL & ENVIRONMENTAL
ENGINEERING

301 DuPont Hall
University of Delaware
Newark, Delaware 19716-3120
Ph: 302/831-2442
Fax: 302/831-3640

October 5, 2007

TO: Sue McNeil, Professor

FROM: Harry W. Shenton III, Chair

SUBJECT: Proposed Graduate Program

A handwritten signature in black ink, appearing to be "H. Shenton III", written over the "FROM:" line.

This memo is to convey the support of the Department of Civil and Environmental Engineering for the proposed graduate program in Disaster Science and Management.

The theme of the proposed interdisciplinary program is timely, given the repercussions of recent disasters both in the U.S. and in other countries throughout the world. We believe that faculty from our department can make a significant contribution advising students who are interested in the themes of (1) the natural and built environment and (2) resiliency and vulnerability and who have backgrounds in one of the civil engineering disciplines.

We look forward to further development of the program.




COLLEGE OF ARTS AND SCIENCES

DEPARTMENT OF SOCIOLOGY
AND CRIMINAL JUSTICE

322 Edward Laurence Smith Hall
University of Delaware
Newark, Delaware 19716-2580
Ph: 302/831-2581
Fax: 302/831-2607

October 30, 2007

To: Sue McNeil, Director
Disaster Research Center

From: Ronet Bachman, Chair 
Department of Sociology and Criminal Justice

Re: Proposed Graduate Program in Disaster Science and Management

Prior to the Fall of 2006, the Disaster Research Center (DRC) was housed within the Department of Sociology and Criminal Justice. Currently, there are four of our faculty members who are still affiliated with the DRC, which is now located within the College of Arts and Sciences, including Havidan Rodriguez, currently serving as the Vice Provost for Academic Programs and International Programs, Joanne Nigg, Benigno Aguirre, and Tricia Wachtendorf. This letter delineates the Department of Sociology and Criminal Justice concerns about the proposed Disaster Science and Management (DSM) graduate program.

Within the Sociology major, students have the option of obtaining a concentration in Emergency and Environmental Management. Currently, there are fewer than 15 students who are registered for this concentration, compared to approximately 35 in the Law and Society concentration, 35 in the Social Welfare concentration, and 25 in the Health Administration concentration (Note: Sociology majors do not have to enroll in a concentration so these totals do not equal the total number of our majors). In our Sociology Ph.D. program, students also have the opportunity to take a comprehensive examination in the "Collective Behavior/Disaster Studies" area under which courses in the Sociology of Disasters are required. Since 1999, only 9 students have taken this exam.

The Department has been and continues to be very supportive of the faculty members who are affiliated with the DRC. Annually, they are allowed to share a one-course buyout at a rate that is, on average, lower than the typical 12.5% that other faculty must obtain

for a course reduction. We also allow them to teach disaster-related courses on a regular basis, much more frequently than the demand from our undergraduate and graduate programs require. In fact, in the past, most of these graduate seminars have typically not had more than 3 or 4 Sociology students enrolled. As such, we believe we are already significantly contributing to the mission of the DRC.

Of course, we also get a great deal in return including the funding of a mean number of 5 of our graduate students annually in the past 5 years. These students get a wealth of research experience that would not ordinarily be available to them. The Department also receives its share (14%) of the indirect funds obtained from grants awarded to our faculty members affiliated with the DRC. In 2006, this was approximately \$9,000. This year, the Department will acquire the full 28% of the F&A to recover a portion of a typical 12.5% buy-out for a DRC affiliated faculty member.

The sample Ph.D. curriculum plan includes a course titled "Introduction to Disasters" (DISA 650), which sounds very much like at least 1 of our courses. In addition, the plan calls for at least 4 other courses that are either not specified or are electives within the curriculum. From an administrative standpoint, there have been no additional faculty members hired to meet these demands. As such, I am concerned that the faculty affiliated with our department will be called upon to teach these required courses. While we are certainly willing to enroll students from the new DSM program into disaster-related Sociology courses when they are offered, we would not be able to increase the frequency with which they are currently taught nor would we be able to release Sociology faculty affiliated with the Center from teaching core courses in the department. This would have a significant negative impact on meeting our other curriculum needs at both the undergraduate and graduate levels.

In sum, we will enthusiastically welcome DSM students to our courses when they are offered, but we simply cannot increase the quantity of disaster-related courses, nor the frequency with which they are taught. In a presentation on the DSM program made to the Department by Sue McNeil on October 3, we were told that the new curriculum would not require additional resources from the department in the form of either 1) committing Sociology faculty affiliated with the Center to teach courses nor in 2) asking the department to hire additional Sociology faculty in the disaster field. As such, if additional faculty members are not hired to meet the DSM course requirements, I do not see how the DSM graduate program can possibly go forward.



DIVISION OF PROFESSIONAL
AND CONTINUING STUDIES
OFFICE OF THE ASSISTANT PROVOST

214-215 Clayton Hall
University of Delaware
Newark, Delaware 19716-7410
Ph: 302/831-2795
Fax: 302/831-1077

June 4, 2008

Sue McNeil, Ph.D., PE
Professor, Department of Civil and Environmental Engineering
Director, Disaster Research Center
Director, University Transportation Center
University of Delaware
Newark, DE 19716

Dear Sue:

This letter is in support of the proposed graduate program in disaster science and management. Professional and Continuing Studies, through UD Online, will work with you and the program as requested to offer courses through distance learning. Services we could provide include registration assistance, instructional design, and course delivery via the Internet or other distance learning approaches.

We are excited about supporting this innovative and dynamic program.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim".

James K. Broomall, D.Ed.
Assistant Provost

JKB/jwc



SCHOOL OF NURSING

McDowell Hall
University of Delaware
Newark, Delaware 19716-3710
Ph: 302/831-1253
Fax: 302/831-2382
E-mail: ud-nursing@udel.edu

31 October 2007

Dr. Sue McNeil
Director, Disaster Research Center
360D DuPont Hall
University of Delaware
Newark, DE 19716

Dear Dr. McNeil,

It is with a great deal of pleasure that I write in support of the Doctor of Philosophy (PhD) program in Disaster Management that is being proposed by the University Of Delaware. The multiplicity of disasters that have occurred in the past several years is mute testimony to the overwhelming need for such a program. One need only consider the effects of the attacks that occurred on 9-1-1, hurricane Katrina, the California Fires of 2007, etc to see that such a program would benefit our nation.

The University Of Delaware is renowned for its leadership in the area of disaster research. Its legacy stems from the fact that in 1963 a Disaster Research Center was founded at Ohio State University as the first social science center in the world to be devoted to the study of disasters. In 1985 that Center moved to the University of Delaware where it has grown in stature and productivity. Researchers at the Center have conducted studies of hurricanes, floods, earthquakes, tornadoes, hazardous chemical incidents and plane crashes. Staff have conducted some 600 studies since the Center's inception. Hence the level of expertise that has grown to national and international prominence has propelled the University of Delaware into its pre-eminent position as the world's resource for disaster studies.

Given its rich history and its world renowned Disaster Research Center the PhD in Disaster Management seems a logical progression for interdisciplinary study. The School of Nursing supports, without reservation, this proposed PhD in Disaster Management. If you need additional information, please do not hesitate to contact me.

Sincerely,


Kenneth P. Miller, PhD., RN, CFNP, FAAN
Director, School of Nursing
University of Delaware




UNIVERSITY OF
DELAWARE LIBRARY
OFFICE OF THE DIRECTOR

University of Delaware
Newark, Delaware 19717-5267
Phone: 302/831-2231
Fax: 302/831-1046
Library Web: <http://www.lib.udel.edu>

October 26, 2007

MEMORANDUM

To: Susan McNeil
Director
Disaster Research Center

From: Susan Brynteson 
The May Morris Director of Libraries

I am responding to your request to supply information about the capability of the University of Delaware Library to support the proposed Interdisciplinary Graduate Program in Disaster Science and Management.

The University of Delaware Library is well able to support the proposed new program up to and including at the doctoral level. Enclosed is a description of collections, resources and services available.

I would be pleased to respond to any questions.

SB/nb
Enclosure

c: Erin Daix, Associate Librarian, Reference Department



UNIVERSITY OF
DELAWARE LIBRARY
OFFICE OF THE DIRECTOR

University of Delaware
Newark, Delaware 19717-5267
Phone: 302/831-2231
Fax: 302/831-1046
Library Web: <http://www.lib.udel.edu>

October 26, 2007

Report on Library Services and Collections in Support of an
Interdisciplinary Graduate Program in Disaster Science and Management

General Description

The University of Delaware Library includes the Hugh M. Morris Library, where the main collection is housed, and three branch libraries located on the Newark campus--the Agriculture Library, the Chemistry Library, and the Physics Library--and a fourth branch library, the Marine Studies Library, located in Lewes, Delaware. The Library collections parallel the University's academic interests and support all disciplines. In addition to collections which directly support Disaster Science and Management, the Library has strong collections in other areas that relate to the Disaster Science and Management, such as: Civil Engineering; Communication; Computer and Information Sciences; Economics; Environmental Studies; Geography; Geology; Health Sciences; History; Natural Resource Management; Operations Research; Political Science and International Relations; Psychology; Sociology; Statistics; and Urban Affairs and Public Policy.

Books, periodicals, microforms, government publications, computer databases and other electronic resources, maps, manuscripts, and media provide a major academic resource for the University of Delaware, the surrounding community, the state of Delaware, and the nation. Library staff members provide a wide range of services, including reference assistance, circulation, interlibrary loan, instructional programs, multimedia design, and assistance to the visually impaired.

The University of Delaware Library is a U.S. depository library and a U.S. patent depository library and contains a complete file of every patent the U.S. Office of Patents and Trademarks has issued.

The online catalog, DELCAT, provides access to millions of items by author, title, subject, and keyword.

Library collections include over 2,700,000 volumes and are broad-based and comprehensive.

The University of Delaware Library is a member of the Association of Research Libraries, OCLC, the Center for Research Libraries, PALINET, CIRLA (The Chesapeake Information and Research Library Alliance), NERL (NorthEast Research Libraries), and Portico.

Specific Support for Disaster Science and Management

A professional librarian, Erin Daix, Associate Librarian in the Reference Department, serves as liaison to the faculty in the Disaster Research Center. Suggestions for purchases received by the Library for materials related to the Disaster Research Center are directed to Ms. Daix, who also regularly consults faculty about priorities and the direction the collections should take. Ms. Daix is also available for instruction in the use of the Library for students and faculty.

Ms. Daix maintains a subject Web site for Disaster Studies which can be accessed from the Library Web www.lib.udel.edu by clicking on "Subject Guides A to Z" or directly by the URL <http://www2.lib.udel.edu/subj/disasters/>. In addition to electronic resources, it contains detailed descriptions of selected primary resources including printed collections; visual material; and manuscripts and archival materials.

Support for the Disaster Research Center is supplemented by funds used to purchase materials in the related areas noted previously as well as funds for the purchase of electronic resources.


In early 2005, the University of Delaware Library officially launched the University of Delaware Library Institutional Repository after a pilot during fall 2004 with five participating University of Delaware departments and research centers. During this pilot and after a series of discussions concerning the Disaster Research Center Resource Collection and with the goal of providing online access to materials in the Disaster Research Center collection, the Library digitized more than 30,000 pages of technical reports and non-copyrighted documents from the University of Delaware Disaster Research Center for incorporation into the University of Delaware Library Institutional Repository. The Disaster Research Center materials are now available electronically on a worldwide no-fee basis. The Institutional Repository which uses DSpace open source software now contains more than 65 collections from more than 25 participating departments and research centers. Collections include technical reports, prostatic tissue array images, Excel data files of 18th century tax records, and electronic books. The inclusion of the Disaster Research Center documents in the Institutional Repository was a major factor in contributing to the success on campus of the Institutional Repository.
See: <http://dspace.udel.edu:8080/dspace/handle/19716/35/>

The Library subscribes to many print journals and electronic journals which support the Disaster Research Center. A list of electronic journals by subject is available from the Library Web by clicking on "Electronic Journals" at the top of the main page.
See: <http://www.lib.udel.edu/>.

In addition to various reference sources in print, the Library also makes available several multidisciplinary electronic databases and subject databases which would support the work of students and faculty in Disaster Science and Management, including: [ABI/INFORM](#); [Academic OneFile](#); [AccessUN](#); [AccuNet/AP Multimedia Archive](#); [AGRICOLA](#); [America: History and](#)

Life; Aquatic Sciences Set; Biological Abstracts; Biological and Agricultural Index Plus; Expanded Academic ASAP Plus; Business Source Premier; CINAHL; Compendex; Computer Database; CQ Researcher Plus; EconLit; EIU Country Profiles; EIU Country Reports; Environmental Sciences and Pollution Management; Expanded Academic ASAP; GEOBASE; GeoRef; Health Reference Center Academic; Historical Abstracts; New York Times; Homeland Security Digital Library; Knovel; LexisNexis Academic, and additional LexisNexis databases; MEDLINE; Opposing Viewpoints; PAIS International; Population Index; ProQuest Dissertations and Theses, PsycINFO; Public Administration Abstracts; PubMed; Readers' Guide Retrospective; Sociological Abstracts; STAT-USA; TOXNET; Urban Studies Abstracts; ViewsWire; Web of Science; and World News Connection. Many of these databases incorporate the Library's major linking service, Article Express, for electronic access to the full text of journal articles. Additional databases that support the Disaster Research Center are available from the databases section of the Disaster Studies Subject Guide.
See: <<http://www2.lib.udel.edu/subj/disasters/db.htm/>>.

The Library also has a strong collection of videotapes and films which cover a wide range of subjects including Disaster Studies. The video collection is heavily used; is increasing in size; and there has been much consultation about it by Francis Poole, Librarian and Head of the Instructional Media Collection Department, with faculty in all areas.


Susan Brynteson
The May Morris Director of Libraries

C. Transfer/Retention Policy

Not Applicable

D. Letters of Approval from Contributing Departments and Centers

Department of Political Science and International Studies

School of Education

School of Urban Affairs and Public Policy (courses)

School of Urban Affairs and Public Policy (program approval)

Disaster Research Center core faculty



DEPARTMENT OF
POLITICAL SCIENCE AND
INTERNATIONAL RELATIONS

University of Delaware
Newark, Delaware 19716-2574
Ph: 302/831-2355
Fax: 302/831-4452

October 25, 2007

Sue McNeil
Director
Disaster Research Center
University of Delaware

Dear Sue,

With this letter I would like to state the support of the Department of Political Science and International Relations for an Interdisciplinary Graduate Program in Disaster Science and Management (DSAM). We understand that the program will offer both the MA and PhD degrees. Initially, the program will recruit an estimated four to six students per year with an ultimate goal of about 15 new students per year.

The main contribution of the Department of Political Science and International Relations will be our course POSC 656 (The Politics of Disaster), taught by Professor Rick Sylves, which will serve as one of the core courses for the program. Professor Sylves typically teaches the course once each year (co-taught with POSC 456) and will be delighted to include the DSAM students in his class.

We look forward to working with you on this new and exciting program.

Sincerely,

A handwritten signature in cursive script that reads "Gretchen".

Gretchen Bauer

Professor and Chair




COLLEGE OF HUMAN SERVICES, EDUCATION & PUBLIC POLICY

SCHOOL OF EDUCATION

Willard Hall
University of Delaware
Newark, Delaware 19716-2922
Ph: 302/831-2573
Fax: 302/831-4110

January 14, 2009

TO: Sue McNeill, Professor and Director
Disaster Research Center

FROM: Kathleen Minke, Acting Director 
School of Education

RE: Proposed degree in Disaster Science and Management

I am writing to convey the support of the School of Education for the proposed graduate program in Disaster Science and Management. We are pleased to welcome students from this program into two of our graduate level research and statistics courses, EDUC 665 and EDUC 850. Please note that only one section of EDUC 850 will be appropriate for these students; it is the section taken by Ed.D. students and does not have a co-requisite. The faculty members teaching these courses agree that the courses should be open to the students in the proposed degree program.

We look forward to collaborating with faculty in this innovative interdisciplinary program.



SCHOOL OF URBAN AFFAIRS
AND PUBLIC POLICY

Graham Hall
University of Delaware
Newark, Delaware 19716-7310
Ph: 302/831-1687
Fax: 302/831-3587
E-mail: SUAPP@UDEL.EDU
Internet: www.udel.edu/suapp

October 25, 2007

TO: Sue McNeil, Professor and Director
Disaster Research Center

FROM: *Maria Aristigueta*
Maria Aristigueta, Director
School of Urban Affairs and Public Policy

SUBJECT: Proposed Graduate Program Support

This memo is to convey the support of the School of Urban Affairs and Public Policy for the proposed graduate program in Disaster Science and Management.

This proposed interdisciplinary program certainly has a place in graduate education, and the need for professionals in this area is obvious given the recent disasters both in the U.S. and other countries throughout the world.

We feel that faculty from the School of Urban Affairs and Public Policy can make a significant contribution in helping students obtain the knowledge and skills needed to complete this interdisciplinary program. The School also supports having UAPP 819 – Management Decision Making – included in the core program for Master's students.

We look forward to further development of the program and collaboration between our disciplines.



SCHOOL OF URBAN AFFAIRS
AND PUBLIC POLICY

Graham Hall
University of Delaware
Newark, Delaware 19716-7310
Ph: 302/831-1687
Fax: 302/831-3296
E-mail: SUAPP@UDEL.EDU
Internet: www.udel.edu/suapp

To: Sue Mc Neil, Director, Disaster Research Center
From: *Maria Aristigueta*
Maria Aristigueta, Director, School of Urban Affairs & Public Policy
Re: Proposed Master of Science in Disaster Science and Management
Date: January 13, 2009

I am writing to state the strong support of the SUAPP faculty for the Master of Science degree in Disaster Science and Management as described in the proposal. The faculty as a whole has reviewed the proposal and voted unanimously to serve as the academic home for the degree program. The faculty is also in favor of the changes to utilizing methods courses already available through programs in CHEP. The program will serve as a nice complement to our MPA and MA degrees, and the students graduating from the proposed Public Policy and existing Leadership undergraduate programs might well be interested in pursuing the MS Disaster Science and Management.

The proposed interdisciplinary program is timely, given the repercussions of recent disasters both in the U.S. and in countries throughout the world. We believe that faculty from our department can make a significant contribution advising students who are interested in the science and management of disasters.

We are particularly supportive of this program because of the opportunity it provides to collaborate with the Center for Disaster Research other units. The integrative model of teaching, research, and service is paramount to the mission of the School.

Thank you for the opportunity to collaborate and serve as the academic home for this exciting program. We look forward to participating in its success.



Disaster Research Center
Newark, Delaware 19716-2581
Ph: 302/831-6618
Fax: 302/831-2091
www.udel.edu/DRC

Director
Sue McNeil
Core Faculty
Benigno E. Aguirre
Rachel A. Davidson
Earl (Rusty) Lee, II
Joanne M. Nigg
Havidán Rodríguez
Tricia Wachtendorf
Founding Directors
Russell R. Dynes
E.L. Quarantelli

November 14, 2008

Faculty Senate

Graduate Program Committee

The core faculty of the Disaster Research Center (DRC) enthusiastically support the proposed interdisciplinary graduate program in Disaster Science and Management. Four core faculty, Benigno Aguirre, Sue McNeil (chair) Joanne Nigg and Havidán Rodríguez, have participated in the committee that developed the program. The proposed program formalizes the interdisciplinary graduate education that has been occurring at DRC, responds to the growing demands for professionals and academicians in this field, and is consistent with the DRC's commitment to interdisciplinary and multidisciplinary research.

Of course, the involvement of the DRC core faculty in the proposed program is subject to negotiation of new or redistributed resources as each core faculty member has ongoing teaching and research commitments. We see our involvement in the proposed program through four mechanisms:

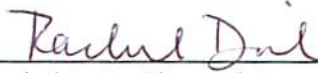
- Teaching – The proposed new courses could be taught by several of our core faculty. Our existing courses also serve as electives.
- Advising – We anticipate serving as academic advisors as well as thesis and dissertation advisors and committee members for the graduate students in the program.
- Graduate student support – Some of our ongoing and proposed research projects will provide support for graduate students in the program.
- Administration – The governance structure outlined in the proposal uses faculty committees to administer the program. We envisage playing active roles on these committees.

The proposed program complements our existing education programs and research activities, meets the needs for faculty and professionals in this rapidly growing area, builds on the foundation DRC has as the premier social science research center in disasters and emergency management, and reinforces our commitment to the transition to an interdisciplinary center. We look forward to being a part of this exciting new opportunity.

DRC Core Faculty



Benigno E. Aguirre, Ph.D.
Professor, Sociology and Criminal Justice
Core Faculty, Disaster Research Center



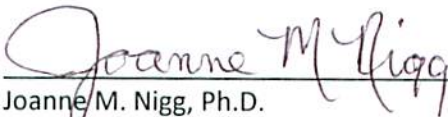
Rachel A. Davidson, Ph.D.
Associate Professor, Civil and Environmental Engineering
Core Faculty, Disaster Research Center



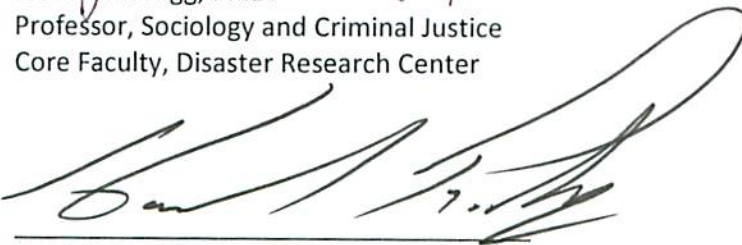
Earl Lee, Ph.D.
Assistant Professor, Civil and Environmental Engineering
Core Faculty, Disaster Research Center



Sue McNeil, Ph.D., P.E.
Director, Disaster Research Center
Professor, Civil and Environmental Engineering



Joanne M. Nigg, Ph.D.
Professor, Sociology and Criminal Justice
Core Faculty, Disaster Research Center



Havidán Rodríguez, Ph.D.
Vice-Provost for Academic Affairs & International Programs
Professor, Sociology and Criminal Justice
Core Faculty, Disaster Research Center



Tricia Wachtendorf, Ph.D.
Assistant Professor, Sociology and Criminal Justice
Associate Director, Disaster Research Center

E. Selected Sample Curricula

F. Potential Affiliated Faculty

Department	Faculty member	Rank
Animal and Food Sciences	Jack Gelb	Professor
Animal and Food Sciences	Kali Kniel	Assistant Professor
Anthropology	Carla Guerron-Montero	Assistant Professor
Anthropology	Karen Rosenberg	Professor
Anthropology	Patricia Sloane-White	Professor
Art Conservation	Debbie Norris	Professor
Bioresources Engineering	Eric Benson	Assistant Professor
Bioresources Engineering	Shreeram Inamdar	Assistant Professor
Bioresources Engineering	William Ritter	Professor
CADSR	Ed Ratledge	Associate Professor
Center for Disability Studies	Michael Gamel-McCormick	Professor
Center for Energy and Environmental Policy	John Byrne	Professor
Civil Engineering	Nii Attoh-Okine	Associate Professor
Civil Engineering	Rachel Davidson	Associate Professor
Civil Engineering	Earl (Rusty) Lee	Assistant Professor
Civil Engineering	Sue McNeil	Professor
Communications	Elizabeth Perse	Professor
Economics	Burt Abrams	Professor
English	Deborah Alvarez	Assistant Professor
Entomology & Wildlife Ecology	Doug Tallamy	Professor
Entomology & Wildlife Ecology	Jack Gingrich	Research Scientist
Food and Resource Economics	John MacKenzie	Associate Professor
Food and Resource Economics	Josh Duke	Associate Professor
Food and Resource Economics	Titus Awokuse	Associate Professor
Food and Resource Economics	Tom Ilvento	Professor
Geography	Tracy DeLiberty	Associate Professor
Geography	Karen Tomic	Supplemental Faculty
Geography	Dan Leathers	Professor
Health Sciences	Jim Richards	Professor
History	Arwen Palmer Mohun	Associate Professor
HRIM	Fred DeMicco	Professor
IFS	Barbara Settles	Professor
Marine Policy	James Corbett	Associate Professor
Marine Studies and Earth Sciences	Nancy Targett	Professor
Nursing	Bethany Hall-Long	Associate Professor
Plant and Soil Sciences	Donald Sparks	Professor
Plant and Soil Sciences	Eric Wommack	Associate Professor
Plant and Soil Sciences	Jeff Fuhrmann	Professor

Plant and Soil Sciences	Tom Sims	Professor
Plant and Soil Sciences	Yan Jin	Professor
Political Science	Dan Green	Associate Professor
Political Science	Muqtedar Khan	Associate Professor
Political Science	Stuart Kaufman	Professor
Political Science	Rick Sylves	Professor
Sociology	Eric Rise	Professor
Sociology/DRC	Benigno Aguirre	Professor
Sociology/DRC	Joanne Nigg	Professor
Sociology/DRC	Havidan Rodriguez	Professor
Sociology/DRC	Tricia Wachtendorf	Assistant Professor
Urban Affairs	Young-Doo Wang	Professor
Urban Planning	David Ames	Professor
Urban Affairs	Jeff Raffel	Professor

All faculty listed have PhDs and are full-time regular faculty.

2. Transcript(s) of any open hearing(s) required by the Faculty Senate Coordinating Committee on Education.

Not applicable

3. List of any concerns raised by Faculty Senate Committees at the provisional approval stage.

Not applicable

4. Letters of support for the permanent status approval of the program from the department Chair and the Dean of the corresponding college.

Letter from Dean Watson, College of Arts and Sciences and Professor Leland Ware, Director, School of Public Policy and Administration.

30 October 2015

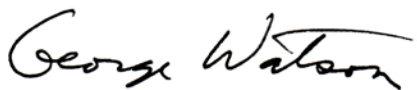
As Dean of the College of Arts and Sciences (CAS), I wish to express my support for the School of Public Policy and Administration's (SPPA) Disaster Science and Management (DISA) Program (MS and PhD) to receive Permanent Status.

CAS values excellence in teaching and research, diversity, and community engagement as it pursues strategic goals of developing outstanding students and faculty. In all of our graduate programs we seek to advanced skills related to critical thinking, open inquiry, and experiential learning, and promoting scholarly and service oriented relationships with local, national, and global communities. The SPPA DISA degree programs support these values and strategic goals through its activities related to the study of public sector emergency management; public policy on the environment and natural/manmade disaster planning; data collection and analysis; and issues of environmental justice for domestic and global communities.

Through integrated teaching, scholarship, and community/public service, the work of SPPA faculty and graduate students impacts public, private, and non-profit policies in ways which improve social and political performance. Also, the hands on opportunities provided to students through both the programs and the Disaster Research Center (DRC) provide unique opportunities to understand diverse perspectives on governance, emergency planning and response, and the policy making process.

SPPA has been resourceful and innovative in pursuing engagement with international academic, federal, state, and local public sector entities. In addition, it is anticipated that the DISA degree programs will improve the attractiveness of SPPAs other professional degree offerings like the online Masters of Public Administration. The college will work with SPPA to ensure the DISA Programs are successful in pursuing mutually shared goals and values, and we hope that the Faculty Senate will agree that the program deserves permanent status.

Sincerely,



George H. Watson
Dean



School of Public Policy & Administration

INSTITUTE FOR PUBLIC ADMINISTRATION
CENTER FOR COMMUNITY RESEARCH & SERVICE
CENTER FOR HISTORIC ARCHITECTURE & DESIGN
CENTER FOR APPLIED DEMOGRAPHY & SURVEY RESEARCH

184 Graham Hall
Newark, DE 19716-7310
Phone: 302-831-1687
Fax: 302-831-3296
Email: sppa@udel.edu

To: University of Delaware Faculty Senate

From: Leland Ware, Director, School of Public Policy and Administration

Date: October 26, 2015

RE: Permanent approval of the graduate program in Disaster Science and Management (MS and PhD)

I am writing to recommend approval by the faculty senate of the proposed permanent graduate degree (MS and PhD) in Disaster Science and Management and confirm the School of Public Policy and Administration's continued commitment to this program.

The program was launched in 2009 and the first intake of students was in 2010. This unique program has several tangible measures of success to demonstrate both the impact and productivity of the program. In just five years the program has graduated 9 PhDs and 18 MS students. Six of the 9 PhD graduates have been placed in academic institutions. A third of the MS graduates are pursuing or have pursued PhD degrees and a quarter are working in emergency management for government. The students have presented at conferences, published papers in archival journals and won awards. We are proud of what they have achieved. While not a large program and with only limited resources, the current enrollment of 27 students represents a sustainable, steady state.

The School of Public Policy and Administration serves as the academic home for this interdisciplinary program. Two of the core faculty, Professor James Kendra and Professor James Trainor, have primary appointments in SPPA and they teach the core courses, DISA 650 – Introduction to Disasters, International Comparative Analysis of Disasters and DISA 670 – Issues in Disaster Response. Several SPPA courses, particularly UAPP 684 -- Performance Management and Program Evaluation (formerly UAPP 698 - Management Decision Making for Public and Non-Profit Sectors) and UAPP 808 – Qualitative Methods for Program Evaluation serves as options for meeting the requirements of the core curriculum. While this interdisciplinary program is housed in SPPA, students takes classes from a variety of programs and colleges to tailor the degree to their interests, skills and needs. Faculty from SPPA, Sociology (Aguirre, Watchendorf and Nigg), and Civil Engineering (Davidson, Lee and McNeil) serve as the primary academic, thesis and dissertation advisors.

The SPPA faculty discussed the proposed permanent program at a regular faculty meeting. The faculty unanimously supported the approval of the Disaster Science and Management program (both MS and PhD degrees) for permanent approval. I fully support this proposed permanent program.

5. Program review report (if applicable).
Not applicable
6. New letters of approval from other affected departments.

The following letters and emails are attached:

- Civil Engineering and Environmental Engineering – Tripp Shenton
- Education – Ralph Ferretti
- Geography – Del Levia
- Marine Science and Policy - Mark Moline
- Sociology – Kirk Williams



College of Engineering

DEPARTMENT OF CIVIL
& ENVIRONMENTAL ENGINEERING

301 DuPont Hall
University of Delaware
Newark, DE 19716-3120
Phone: 302-831-2442
Fax: 302-831-3640

October 28, 2015

To: Sue McNeil, Professor
Civil and Environmental Engineering
DISA Program Director

From: Tripp Shenton, Chair
Department of Civil and Environmental Engineering

A handwritten signature in black ink, appearing to read 'Tripp Shenton', with a large loop at the end.

Subject: Permanent status of Disaster Science and Management program

The Department of Civil and Environmental Engineering fully supports the application of the Disaster Science and Management graduate program for permanent status. Given the astounding cost, both in terms of loss of life, injury, and property damage caused by natural and man-made disasters experienced around the world in recent decades, the DISA program was designed to fill a glaring need for professionals with training to deal with these disasters. Enrollment in the program has clearly demonstrated that it is viable and sustainable. The DISA program has also facilitated collaboration between engineering, the sciences, and social sciences, through classes and also in research, which is greatly needed today if we are going to solve these complex problems. We are happy to support the DISA program and look forward to its continued success for many years to come.

From: [Ferretti, Ralph P](#)
To: [McNeil, Sue](#); [Ferretti, Ralph P](#)
Subject: Permanent Status of the Disaster Science and Management Program
Date: Thursday, October 15, 2015 8:17:49 PM

Dear Professor McNeil,

Thanks you for thinking to include EDUC 665 and EDUC 850 in your application for Permanent Status of of the Disaster Science and Management program (DISA). We wish you and your colleagues the greatest success, and are pleased to welcome your students in these courses.

Please write if I can help ensure the success of your application for Permanent Status.

Best regards,

Ralph

Ralph P. Ferretti
Director, School of Education
Professor of Education,
and Psychological & Brain Sciences
email: ferretti@udel.edu
phone: (302) 831-1644

From: "McNeil, Sue" <smcneil@udel.edu>
Date: Sunday, October 11, 2015 at 12:37 PM
To: "Ferretti, Ralph P" <ferretti@udel.edu>
Cc: "McNeil, Sue" <smcneil@udel.edu>
Subject: Permanent Status of the Disaster Science and Management Program

Dear Professor Ferretti:

I am writing to seek your support for our application for Permanent Status for the Disaster Science and Management Program (DISA) (MS and PhD). The program was launched in 2009 and our first intake of students was in 2010. We have since graduated 9 PhDs and 18 MS students. While not a large program and with only limited resources, we see our current enrolment at 27 students to represent a sustainable steady state.

This has been an important initiative and I hope that you will continue to support it. Several of our graduates and current students have taken classes in Education, particularly EDUC 665 Elementary Statistics and EDUC 850 Qualitative Research in Education. Over the past five years, approximately 19 DISA students have taken EDUC 665 and 15 DISA students have taken EDUC 850. I do not believe we have overwhelmed these classes. Furthermore, informal feedback from faculty teaching EDUC 850 has indicated that they have welcomed the perspectives the DISA students bring to the

classroom.

I would appreciate a response by October 28th, so I may submit the materials to the Faculty Senate by their November 1 deadline. If you have any questions please do not hesitate to contact me.

Regards

Sue

Sue McNeil

Professor, Department of Civil and Environmental Engineering

Program Director, Disaster Science and Management

University of Delaware

Editor-in-Chief, Journal of Infrastructure Systems

Telephone: 302 831 6578

Email: smcneil@udel.edu

From: [Delphis Levia](#)
To: [McNeil, Sue](#)
Subject: Re: Permanent Status of the Disaster Science and Management Program
Date: Monday, October 12, 2015 2:52:03 PM

Dear Sue,

As Chair of the Department of Geography, I write in full support to make the Disaster Science and Management Program (DISA) (MS and PhD degrees) permanent.

Kind regards,
Del Levia

Delphis F. Levia, Ph.D.
Professor of Ecohydrology
Chair, Department of Geography
Joint Appt., Department of Plant & Soil Sciences
University of Delaware, Newark, DE 19716-2541, USA
Series Editor, Ecological Studies- Analysis and Synthesis (Springer-Verlag)
Skype: del.levia; Tel: (302) 831-3218; Fax: (302) 831-6654

On Fri, Oct 9, 2015 at 2:29 PM, McNeil, Sue <smcneil@udel.edu> wrote:

Dear Del:

I am writing to seek your support for our application for Permanent Status for the Disaster Science and Management Program (DISA) (MS and PhD). The program was launched in 2009 and our first intake of students was in 2010. We have since graduated 9 PhDs and 18 MS students. While not a large program and with only limited resources, we see our current enrolment at 27 students to represent a sustainable steady state.

The Department of Geography supported our original proposal for the program in 2008 and the Marine Science and Policy Program has made some important contributions to the program, particularly through the participation and involvement of Professor DeLiberty, Professor Leathers and Professor Yangs. They have taught classes that our students have taken, participated in MS thesis and PhD dissertation committees and given seminars to our students. Next semester Terrienne Lavin will be teaching DISA667/GEOG 667 on natural hazards.

The original proposal aimed to develop an interdisciplinary graduate program in Disasters that would take advantage of the breadth of relevant course across campus without overwhelming any one course, program or department. Approximately 30 students, over five years, have taken the GIS courses ranging from GEOG670 to the special topics courses. I believe three of our students have almost completed the GIS certificate. We really value the cooperation and collaboration with Geography, so I hope you will continue to support the program.

This has been an important initiative. I would appreciate a response by October 28th, so I may submit the materials to the Faculty Senate by their November 1 deadline. If you have any questions please do not hesitate to contact me.

Regards

Sue

Sue McNeil

Professor, Department of Civil and Environmental Engineering

Program Director, Disaster Science and Management

University of Delaware

Editor-in-Chief, Journal of Infrastructure Systems

Telephone: [302 831 6578](tel:3028316578)

Email: smcneil@udel.edu



College of Earth, Ocean,
& Environment
SCHOOL OF MARINE SCIENCE & POLICY

Hugh R. Sharp Campus
700 Pilottown Road
Lewes, DE 19958-1298 U.S.A.

October 29, 2015

Dear Sue McNeil,

I am writing to support for our application for Permanent Status for the Disaster Science and Management Program (DISA) (MS and PhD). I understand the program was launched in 2009 with the first student cohort in 2010. To date you have graduated 9 PhDs and 18 MS students and have a current consistent enrollment of ~25 students. Although small program, I believe this is an important offering for the University and one that will grow with time.

The College of Earth, Ocean and the Environment supported the original proposal for the program in 2008 and I have kept up with the progress of the program through the involvement of one of our Marine Science and Policy Program Professor Corbett, who shares a joint appointment. Currently MAST 633 serves as one of two alternative courses required for the MS degree and PhD students have also been encouraged to take this class. Over the past five years 24 DISA students have completed the class. Professor Corbett has also served on several MS and PhD committees and helped prepare the students for the qualifier exam. He has also served as the primary advisor for one MS student supported by a Fulbright. His contributions to this program are consistent with his current workload assignment and I value the interdisciplinary perspective his involvement has provided to his career and our students that share classes with the DISA students.

As mentioned, I think this is an important area of study and I hope to continue supporting it. I fully recommend transition of DISA to permanent status. If you have any further questions please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark A. Moline'.

Mark A. Moline
Director, School of Marine Science and Policy

From: [Williams, Kirk Ralph](#)
To: [McNeil, Sue](#)
Subject: RE: Permanent Status of the Disaster Science and Management Program
Date: Thursday, October 29, 2015 10:47:18 AM

Hi Sue,

I'm sorry for the slow reply. To be honest, somehow I lost your initial request, so I'm pleased you sent this reminder. Let me say that I completely and unconditionally support the Disaster Science and Management Program. I see it as an integral part of the Department's connection with the Disaster Research Center. Three of our faculty play instrumental roles in that Center and collaborate with your program in scholarship and instruction. Our students benefit from participating in graduate seminars that also involve your students, particularly those in the areas of disasters and the environment as well as health. I firmly believe that the future will bring many opportunities for collaborative projects between the Disaster Science and Management Program and our graduate program. In short, as Chair, I enthusiastically support your application for permanent status and hope this will be granted. It will be mutually beneficial for our faculty and graduate students. Let me know if I can be of further assistance.

Sincerely, Kirk

Professor and Chair
Department of Sociology and Criminal Justice
University of Delaware
Newark, DE 19716
(302) 831-2581
kirkw@udel.edu

From: McNeil, Sue
Sent: Wednesday, October 28, 2015 9:29 PM
To: Williams, Kirk Ralph
Cc: Aguirre, Benigno E; Nigg, Joanne Marie; Wachtendorf, Tricia L.; McNeil, Sue
Subject: RE: Permanent Status of the Disaster Science and Management Program

Dear Kirk:

Our deadline for submitting materials to the faculty senate is rapidly approaching. I am wondering if I will be able to get a response from you in the next few days?

Please do not hesitate to contact me if you have questions.

Regards

Sue

From: McNeil, Sue
Sent: Monday, October 12, 2015 8:33 AM
To: Williams, Kirk Ralph <kirkw@udel.edu>
Cc: McNeil, Sue <smcneil@udel.edu>; Aguirre, Benigno E <aguirre@udel.edu>; Nigg, Joanne Marie <nigg@udel.edu>; Wachtendorf, Tricia L. <twachten@udel.edu>
Subject: Permanent Status of the Disaster Science and Management Program

Dear Kirk:

I am writing to seek your support for our application for Permanent Status for the Disaster Science and Management Program (MS and PhD). The program was launched in 2009 and our first intake of students was in 2010. We have since graduated 9 PhDs and 18 MS students. We are proud of what we have achieved. While not a large program and with only limited resources, nevertheless our current enrollment of 27 students represents a sustainable, steady state.

Sociology supported our original proposal for the program in 2008. We are very thankful for the support we have

received from Sociology and other departments in the university. The Disaster Science and Management Program has been an important initiative and I hope that you will continue to support it. Several of our graduates and current students have taken classes in Sociology (particularly SOCI 605 Data Collection and Analysis; SOCI667 Seminar; and SOCI671 Disasters Vulnerability and Development), but I do not believe we have overwhelmed these classes. Professors Wachtendorf and Aguirre, and Professor Nigg, despite her retirement, continue to be an integral part of the program, as there is synergism between their research interests and the program.

In addition the DISA and Sociology graduate students have benefited from the IAEM@UD student chapter.

Although primarily made up of DISA students, several sociology grad students are quite active in it. Also through IAEM, one of the DISA grad students supervised a service fellowship for two of the emergency and environmental management concentration students this summer.

Looking to the future the departments strategic initiative in health may also provide some opportunities for future collaboration and cooperation as some of our graduate students are interested in this area and seek appropriate electives.

I would appreciate a written response, in the form of a response to this email or a short letter, by October 28th, so I may submit the materials to the Faculty Senate by their November 1 deadline. If you have any questions please do not hesitate to contact me.

Regards

Sue

Sue McNeil

Professor, Department of Civil and Environmental Engineering

Program Director, Disaster Science and Management

University of Delaware

Editor-in-Chief, Journal of Infrastructure Systems

Telephone: 302 831 6578

Email: smcneil@udel.edu