INTERDISCIPLINARY GRADUTE PROGRAM IN DISASTER SCIENCE AND MANAGEMENT (DISA)

Program Policy Statement

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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 program will be administered by a Program Director, Program Committee and other committees as described in Part VI. The program will recruit graduate students from a variety of programs at UD and other schools including the ongoing NSF Research Experience for Undergraduates held at DRC each summer. We will also distribute recruiting material to schools with strong undergraduate programs in related fields and our colleagues at other institutions.

While there are related efforts 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. Existing educational programs such as the PhD in Emergency Management at North Dakota State University and the graduate program in Disaster Science and Management at Louisiana State University address specific aspects of disasters or are not focused on PhD training. The existing IGERT at Vanderbilt University with a theme of "Reliability and Risk Engineering and Management" is broader than disasters. 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.

Graduates will be sought after 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.

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 Urban Affairs and Public Policy 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

This program is seeking approval.

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.

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.
- A recommended GRE score of 1050 on math and verbal sections combined
- 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.

Applicants to the PhD Program must have

- 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.
- 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 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.

Applications are processed as they are submitted. The Program Committee of the Disaster Science and Management Program typically requires a period of 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, 3 semesters of seminar (2 semesters at 1credit per semester and 1 semester 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 - 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 (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)

DISA 680 Disaster Science and Management Seminar (1 credit)
Taken three semesters – two semesters for credit, one semester as a listener

DISA 867 Practicum (1 credit)

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). Suggested elective courses can be found in Appendix A.

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 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 680 Seminar (1) DISA 867 Practicum (1) Elective II (3) Elective III (3)	DISA 867 Practicum (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 1credit 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 - 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 UAPP 815 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)

DISA 680 Disaster Science and Management Seminar (1 credit)
Taken four semesters – two semesters for credit, two semesters as a listener

DISA 867 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 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) Elective (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)	Internship (no credit)
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

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/current/thesismanual.html. 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/current/importantdates.html.

4. Processing the Final Document: Instructions for preparing the final document are posted on the webiste of the Office of Graduate and Professional Studies http://www.udel.edu/gradoffice/current/stepby.html

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 DSEM 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 18 credits of course work have 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 DSEM. 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 candidancy 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 (964). Pre-Candidacy Study (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 (964) for the preceding semester may be changed to the course, Doctoral Dissertation (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 (969). Students may not register for Doctoral Dissertation (969) until admitted to candidacy (G2 status). Registration in Doctoral Dissertation (969) and Doctoral Sustaining (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 (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 General Information Relevant to Both Master's and Doctoral Degree Candidates

5.1 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 numbers 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.

5.2 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.

5.3 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.

5.4 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.

5.5 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.

5.6 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.

5.7 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.)

5.8 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.

5.9 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.

5.10 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.

5.11 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.

5.12 Expiration of Credit

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

6 Program Administrative Structure

The program administrative structure is described in the draft Faculty Bylaws in Appendix E.

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 – Understanding People in Organizations
	BUAD 880 – Marketing Management
	COMM 610 – Organizational Communication Theory
	COMM 630 - Interpersonal Communication Theory
	COMM 670 - Mass Communication Theory
	ECON 503 – Economics for Business Policy
	ECON 832 - Public Finance
	CRJU 420: Criminal Justice Administration (dual-listed with UAPP 620)
	FINC 850 – Financial Management
	SOCI[4] 640 – Societal Issues in Disaster Research
	SOCI 837: Criminology and Systems of Justice
	UAPP 616 - Volunteer Management (1 credit)
	UAPP 658 - Contemporary Issues in Public Administration (1 credit)
	UAPP 65x - Contemporary Issues in Urban Affairs and Planning (1 credit)
	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
[4] Proposed new class – formerly taught as SOCI667

Thematic Area	Class
Built and natural environment, and society	BREG[5] 628 - Natural Wastewater Treatment Systems
	CEIG 633 - Hazardous Waste Management
	CIEG 631 - Water Quality and Pollution Control
	CIEG 650 - Urban Transportation Systems
	CIEG 654 - Urban Transportation Planning
	CIEG 655 – Civil Infrastructure Systems
	CIEG 667 – Resilience Engineering
	ENWC[6] 610 – Medical and Veterinary Entomology
	ENWC 611 – Insect Pest Management
	ENWC 640 – Integrated Pest and Disease Management
	ENWC 814 – Advanced Ecology
	GEOG 617 – Seminar in Climate Change
	GEOG 622 - Resources, Development and the Environment
	GEOG 628 - Issues in Land Use and Environmental Planning
	GEOG 649 - Environment and Society
	GEOL 621 - Environmental and Applied Geology
	MAST 601 - Introduction to Oceanography
	MAST 671 - Coastal Processes and Management
	PLSC[7] 603 – Soil Physics
	PLSC 608 – Environmental Soil Chemistry
	PLSC 619 – Soil Microbiology
	PLSC 655 – Pollution Microbiology
	SOCI 671 - Disasters, Vulnerability & Development
	UAPP 675 - Land Use and Transportation Linkages (1 credit)

[5] Department: Bioresources Engineering
[6] Department of Entomology and Wildlife Ecology
[7] Department of Plant and Soil Sciences

Thematic Areas	Class
Vulnerability and resilience	CIEG667 – Resilience Engineering
	CHEG 622 - Chemicals, Risk and the Environment
	CSCC[8] 481[9] - Issues in Public Health
	FREC[10] 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[11] 610 - Health and the Media
	IFST 604 - Interdisciplinary Gerontology
	IFST 670 - Family Risk and Resiliency
	IFST 870 - Family Crisis and Coping
	MAST 692 - Environmental Values, Movements and Policy
	NURS 613 – Death Education
	POSC 838 - 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

[8] Program: Center for Science and Culture
[9] A graduate level course can be made available
[10] Department: Food and Resource Economics
[11] 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[12] 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 640 - International Development Policy and Administration
	POSC 653 - Politics and Healthcare
	POSC 838 - Public Policy Analysis
	POSC 818 - Environmental Policy and Administration
	SOCI 622 - Collective Behavior
	SOCI 643[13] – Society and Risk
	UAPP 602 - Introduction to Comprehensive Planning (1 credit)
	UAPP 603 - Introduction to Zoning and Land Use Controls (1 credit)
	UAPP 610 - Urban Land Use Planning and Administration
	UAPP 617 - Contemporary Issues in Environment and Energy Policy (1 credit)
	UAPP 657 - Health Policy
	UAPP 662 - Municipal Management

[12] Program: Health Promotion

[13] Proposed new class, formerly taught as SOCI667

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[14]/STAT 608 – Statistical Research Methods
	FREC 682 – Spatial Analysis of Natural Resources
	GEOG 667 - GIS
	GEOG 671 - Advanced GIS
	HLPR 803 - Advanced Health Promotion Programming and Evaluation
	SOCI 611 - Techniques of Demographic Analysis

[14] Department of Food and Resource Economics

Thematic Areas	Class
Health Systems Leadership	HSAD 637 – Health Planning Strategies
	HSAD 638 – Health Services Evaluation
	NURS 6xx[15] – Health Systems Disaster Leadership
	NURS xxx[16] – Biological, Chemical, Radiological and Other Source Emergencies: Planning Response and Public Policy Measures

[15] Proposed new course
[16] 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 UAPP 815 Public Management Statistics) and EDUC 850 – Qualitative Research in Education (or if appropriate UAPP 808 Qualitative Methods for Program Evaluation) as the required 6 credits of methods classes. Other students should choose from this list.

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.

ORES601 Survey Operations Research I
Covers various deterministic mathematical programming methods (LP, integer dynamic), network models and basic inventory models.
Prerequisites: Linear algebra.

ORES602 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.

ORES603 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.

ORES801 OPTIMIZATION MODELS AND METHODS
Models and methods of linear programming, integer programming and non-linear programming. Practical application of simplex method, branch and bound algorithms, and Kuhn-Tucker conditions. Examples from the classic operations research literature.
Prerequisites: ORES601.

ORES802 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 ADVANCED SOCIAL RESEARCH FOR POLITICAL SCIENCE
Provides advanced training in applied social research methods. Topics may include econometrics, qualitative methods, game theory, and agent-based modeling. Includes lectures and discussion supplemented by laboratory work involving computer statistical packages and simulations.

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.

UAPP 808 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.
Prerequisites: UAPP800, IFST615 or comparable research methods course.

UAPP 815 PUBLIC MANAGEMENT STATISTICS
Emphasis on the practical knowledge of statistical techniques and their use in the management of data (or data systems) in the public sector. Discussion and appraisal of various statistical tools from a theoretical standpoint, and application of statistical methods and procedures in a laboratory situation for the collection, organization and analysis of statistical information in public management research.

UAPP816 ADVANCED SOCIAL STATISTICS
Provides advanced training in applied social research. Topics include analysis of variance, regression analysis, analysis of covariance, multi-dimensional cross-classifications and future analysis. Lectures supplemented by laboratory work involving computer statistical packages and simulations.

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 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) EDUC 665 Elementary Statistics (3) DISA 680 Seminar (1)	Internship
2	UAPP 819 – 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 Introduction to Disasters (3) EDUC 850 – Qualitative Research in Education (3) UAPP 819 – Decision Making (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 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 667 Civil Infrastructure Systems
- Specialization 2 – CIEG 667 Resilience Engineering
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 838 Public Policy Analysis
- Elective 1 – UAPP 651 – Managing Risk and Society
- Elective 2 – GEOG 667 – 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 Management and Policy
- Specialization 2 – UAPP 687 State Government Management and Policy
- Research Methods III – MAST 663 Decision Tools for Policy Analysis
- Research Methods IV – POSC 838 Public Policy Analysis
- 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 819 – Decision Making (3) Research Methods III (3) Specialization 1 (3) DISA 680 Seminar (1)		DISA 651 Int. Aspects 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 838 Public Policy Analysis
- Elective 1 – UAPP 651 – Managing Risk and Society
- Elective 2 – GEOG 667 – 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 838 Public Policy Analysis
- 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 838 Public Policy Analysis
- Elective 1 – STAT 608 – Statistical Research Methods
- Elective 2 – Independent study in decision support systems

Appendix D – Proposed New Classes

DISA 650 – Introduction to Disasters (3 credits)
This course provides an overview of disaster science and management at the graduate level including an historical overview of disasters. The course is required for all students entering the MS program in Disaster Science and Management. Topics covered include but are not limited to:

- Anatomy of a disaster
    - Types of disasters
    - Phases of a disaster
    - Impacts/consequences/ environment justice/ equity
        - Built environment
        - Social systems
        - Natural environment
- Government, non government and private sector actors
- Policy and regulation

Students will explore case studies and write a short paper.

DISA 651 – International Aspects of Disasters
This course provides an overview of international disasters, including impacts on development and a comparative analysis of how disasters are dealt with in different countries.

DISA 680 – Disaster Science and Management Seminar (1 credit)
The seminar provides a structured forum for the discussion and analysis of the issues and problems in research and professional practice. The seminar also provides an opportunity for students to present their work and learn about professional practice. The hope is that these discussions will not only enable the participants to learn from their own and each others' experience, but perhaps create a spirit of collegiality and community among participants that will continue after the seminar ends. This class may be repeated for credit. This class is graded pass/fail.

DISA 866 – Independent study (Variable Credits)

DISA 867 – Practicum (1 – 3 credits) (may be repeated)

DISA 868 - Disaster Science and Management Research (Variable Credits)

DISA 869 - Master's Thesis (Variable Credits)

DISA 969 - Doctoral Thesis (Variable Credits)

Other classes:

Two other classes – DISA 655 and DISA 656 were originally proposed and course descriptions were developed. EDUC 665 – Elementary Statistics, and EDUC 850 – Qualitative Research in Education are being substituted for these classes. CHEP is currently undertaking a restructuring of methods classes and consideration will be given to cross listing EDUC 665 and EDUC 850 as DISA 655 and DISA 656 as the restructuring effort evolves.

DISA 655 – Research Methods I: Analysis Tools - Qualitative Research (3 credits)
This course provides an introduction to qualitative analysis methods used in studying disasters including developing evacuation, response and recovery plans, mitigation strategies and enhancing overall preparedness. Specific topics include:

- Interview strategies
- Ethnographic techniques
- Analysis of qualitative data
- Content analysis

DISA 656 – Research Methods II: Analysis Tools - Quantitative Research (3 credits)
This course provides an introduction to quantitative analysis methods used in studying disasters including developing evacuation, response and recovery plans, mitigation strategies and enhancing overall preparedness. Specific topics include:

- Summary statistics
- ANOVA
- Regression
- Risk analysis

Students will be expected to use computer tools and conduct analyses.

UNIVERSITY OF DELAWARE

GRADUATE PROGRAM IN DISASTER SCIENCE AND MANAGEMENT

FACULTY BYLAWS

6/10/08

(DRAFT)

UNIVERSITY OF DELAWARE
Graduate Program in Disaster Science and Management
Faculty Bylaws

1 General Powers

A. Consistent with the Charter of the University, the Trustees Bylaws and the Constitution and Bylaws of the Faculty of the University, the Faculty of the DISA Program is empowered to develop, implement, and evaluate the academic services provided by the Program. The Core Faculty is brought together from different units at the University:

1. The College of Arts and Science including
    a. The Department of Sociology and Criminal Justice
    b. The Department of Political Science and International Relations
    c. The Department of Geography
    d. The Department of English
    e. The Department of Anthropology
2. The College of Agriculture and Natural Resources
3. The College of Engineering including the Department of Civil an Environmental Engineering
4. The College of Human Services, Education, and Public Policy, including the School of Urban Affairs and Public Policy and the Center for Energy and Environmental Policy
5. The College of Health Sciences
6. The College of Marine and Earth Studies
7. The Lerner College of Business and Economics
8. The Disaster Research Center
9. Others

B. The Program Faculty, as a body or through designated committees, assumes the following functions:

1. To seek the continual improvement of academic standards, and achievements in the program.
2. To consider and make recommendations concerning policies governing matters of Faculty welfare. These may include but are not limited to teaching responsibilities and committee membership.
3. To consider and make recommendations concerning policies governing the admission of students to the Program.
4. To admit new graduate students to the Program.
5. To consider and make recommendations concerning policies governing the education of students in the Program.
6. To participate in the research training of qualified graduate students.

7. To communicate Program research policy and coordinate Program research training efforts with appropriate other units within the University with which the Faculty of the Program have affiliations.

C. The Program Faculty is charged with the duty to initiate proposals on all topics listed in Paragraph B above through the appropriate standing committee or Program Director. Recommendations emerging from Faculty, standing committees or the Program Director for a specific function must be approved by two-thirds of the members of the Faculty. Such decisions will be forwarded when necessary to the appropriate College and/or University policy-making body for consideration and approval.

2 Program Membership

A. Faculty

1. The Faculty of the DISA Program shall consist of the Program Director, Professors, Associate Professors, Research Scientists, tenure track and continuing and temporary non-tenure track Assistant Professors, Instructors, and Lecturers who hold full-time appointments in the University including those on official leave. Adjunct Faculty will have all of the rights and privileges of Faculty as defined in the University's policies and procedures and may serve on committees, including thesis and dissertation committees, but cannot serve as the chair.

B. Staff

1. The staff of the DISA Program consists of the Staff Assistant and others.

C. Graduate Student Representative

1. In the spring of each year a representative shall be elected by the students to represent them and to attend DISA faculty meetings.

3 Program Director

A. The Program Director will be appointed by the Dean from the Colllege where the program is housed based on the recommendation of the program committee. He/she serves as chief representative and Executive Officer of the Program. This position holds administrative authority over Program affairs. The Academic Program Director shall exercise leadership in the

formulation of policies and in supervision of activities directed toward the improvement of all Program goals. Responsibilities shall include strengthening Program instruction, research and service and interpreting Program policy and activities to the Colleges, University and community.

B. In the course of administering these responsibilities, the Academic Program Director is expected to consult with the designated representatives of standing and ad hoc committees. In addition, it is the Academic Program Director's function to maintain communication with the Faculty on all matters of concern to the Faculty and the Program as a whole.

C. The Academic Program Director shall be appraised of all recommendations of ad hoc and standing committees or appointed representatives, and shall have an opportunity to respond to same prior to any vote by the Program Faculty.

4 Program Committees

A. General Provisions Regarding Committees

1. A committee authorized by the Faculty of the Program shall be empowered to act as the agent of the Faculty in administering program responsibilities.

2. Faculty appointments shall be for terms of three years unless otherwise noted. These appointments should be staggered to provide for continuity.

3. Each committee shall record minutes of its meetings including participation by individual members. Minutes should be forwarded to the Program Director to be kept on file and distributed to all Faculty members.

4. Committee chairs will prepare an annual report to be summarized at the final Faculty meeting in each academic year. Copies of the annual written reports shall be forwarded to the Program Director at least one week in advance of the last scheduled Faculty meeting in the spring semester.

5. Annual reports will be kept on file in the Director's office and made available to interested Faculty members.

B. Standing Committees

1. Program Committee

a) One member representing each of thematic areas will comprise the Program Committee. These members should come from different University units to maintain diversity. The members of the Program Committee will serve a three-year term on a staggered basis. Members will be nominated by Faculty participating in the thematic area. The Committee will always be comprised of first-year, second-year, and third-year members. This will provide for continuity in the administrative structure. It is expected that all Faculty will be willing to serve in an administrative role on a rotating basis.

b) The responsibilities of the Program Committee are as follows:

i. Serve as the major governing board for the DISA Program, making recommendations to the Director regarding issues such as curriculum, funding, etc.
   a) Oversee and review all matters related to academic standards, courses and curricula offered by the Program.
   b) Review all proposals recommending additions/deletions to existing courses or curricula and make recommendations concerning same to the Faculty.

ii. Review all applications and make decisions regarding admission of students into the DISA Program.

iii. Approve all Plans of Study. (Policies regarding plans of study are specified in the admissions procedures.)

iv. Serve as a review board to assist in resolution of problems/conflicts which arise with either students or faculty within the program.

2. Ph.D. Qualifier Exam Committee

a) One member representing each of thematic areas will comprise the Qualifier Exam Committee. These members should come from different University units to maintain diversity. The members of the Program Committee will serve a five-year term on a staggered basis. Members will be nominated by Faculty participating in the thematic area. The Committee will always be comprised of first-year, second-year, and third-year members. This will provide for continuity in the administrative structure. It is expected that all Faculty will be willing to serve in an administrative role on a rotating basis.

b) The responsibilities of the Qualifier Exam Committee are as follows:

i. Design and prepare annual qualifier examination packages for the cohort of students seeking to qualify for the Ph.D.

aa) Develop self-contained problem package representing an integrated problem(s) in Disaster Science and Management (DISA).

bb) Administer this examination to students under a common set of conditions

ii. Manage the process by which these exams are scored. This could involve all affiliated faculty or could reside with the Qualifier Exam Committee, subject to consensus and direction from Program Committee

iii. Announce decisions of examinations, including any oral/written retest procedures, if determined to apply.

3. Seminar Committee

a) One member from each of the thematic areas will comprise the Seminar Committee and will be chosen by the DISA faculty in that thematic area. The members of the Seminar Committee will serve three-year terms. Terms will be staggered.

b) The responsibilities of the Seminar Committee are as follows:

i. Organize and plan weekly seminars for the Seminar course, through coordination with participating faculty. All faculty are considered responsible for arranging one seminar per year.

ii. Recruit appropriate speakers.

iv. Secure funding for speakers when necessary.

v. Plan student involvement (projects, presentations) in seminar.

4. International Advisory Board

a) Membership consists of individuals associated with disaster management and research. This includes government officials, academicians, and members of public and private agencies. Potential members are nominated by the Program Committee and are invited to join the International Advisory Board by the Dean of Arts and Sciences. The members of the International Advisory Board will serve three-year terms. Terms will be staggered.

b) The responsibilities of the International Advisory Board includes making recommendations to the program regarding research and training opportunities, fund raising, program content, student/faculty recruitment, and job placement opportunities.

c) The International Advisory Board will meet on an annual basis.

5 Organization and Procedures

A. Presiding Officer—The Academic Program Director shall conduct and preside at all meetings of the Program Faculty.

B. Meetings—The Program Faculty shall meet at least once a semester at times determined by the Director. Special meetings of the Faculty may be called by the Director or by written petition of one-third of the voting membership of the Program Faculty at a regular or special meeting of the Faculty.

C. Notice of Meetings—Written notice of Faculty meetings, together with an agenda, shall be distributed to the Faculty at least five days (not including Saturdays or Sundays) in advance of such meetings. At special meetings, only those topics on the announced agenda may be voted upon at that meeting.

D. Agenda—The agenda for regular and special meetings of the Program Faculty shall be prepared by the Director of the Program or a designated representative. The agenda shall include:

1. All items presented by the Director of the Program.
2. All items submitted by Faculty for consideration by committees or the Director.
3. New business not on the announced agenda may be introduced for discussion from the floor or by the Director. A resolution or motion that requires a vote by the Faculty that is not part of the announced agenda can be acted upon only if two-thirds of the Faculty members are present. A commemorative resolution may be introduced and voted upon at any meeting of the faculty.

E. Order of Business—The order of business for regular faculty meetings shall be as follows:

1. Call to order
2. Announcements
3. Approval of minutes of previous meetings
4. Approval of agenda
5. Old business
6. New business
7. Adjournment

F. For purposes of voting on Program related matters the following guidelines shall apply:

1. Proposals involving matters of general interest to the Program Faculty shall be subject to review and vote by the membership described above in Paragraph IIA.
2. Standing committees or specially appointed representatives of the Director are responsible for disseminating information to the Program Faculty in all instances where substantive changes are recommended. This shall be done at least one week in advance of the Faculty meeting at which time the Faculty will vote on such issues.
3. Minor changes in procedure can be accomplished by standing committees. Such actions shall be presented to the Faculty at the final Faculty meeting held in the spring semester.

G. Quorum—A simple majority of the voting membership of the Program Faculty not on official leave shall constitute a quorum. The Faculty shall abide by its own rules or procedures, but in cases where it has adopted no explicit rules, or where applicability of or interpretation of rules is in doubt, Sturgis' Rules of Order Newly Revised shall apply. A parliamentarian may be appointed by the Director.

H. Minutes—The Director shall publish minutes of all meetings of the Program Faculty which shall become the official record upon being submitted to and approved by the Faculty at the first subsequent regular meeting of Faculty.

6 Amendment

These By-Laws may be amended only by a two-thirds affirmative vote of the total Program voting membership. The balloting shall be conducted by secret ballot. Petitions for changes must be placed on the announced agenda and discussed at a general Faculty meeting prior to the balloting. Voting must be concluded within 1 week of the Faculty meeting.