APPROVED BY SENATE
09/21/2015

EP.16.10 Final

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Proposal to the Senate Educational Policy Committee

PROPOSAL TITLE: Proposal to change the department-level requirements for the M.S. degree and Ph.D. degree in Atmospheric Sciences.

SPONSOR: Robert M. Rauber, Professor and Head, Department of Atmospheric Sciences 217-333-2835, r-rauber@illinois.edu

COLLEGE CONTACT: Karen Carney, Associate Dean, College of Liberal Arts and Sciences, 333-1350, kmcarney@illinois.edu

BRIEF DESCRIPTION:

For both the M.S. and Ph.D. programs in Atmospheric Sciences we will require 4 core courses (ATMS 500, ATMS 504, ATMS 505, and ATMS 507) that are fundamental to our science. For the Ph.D. in Atmospheric Sciences we will eliminate the qualifying exam and the current requirement that students must take at least one course per semester (not including ATMS 599) until the preliminary exam is passed. In place of the latter requirement, we will require that all Ph.D. students complete a minimum of 48 hours of graduate level course work and a minimum of 16 hours of thesis course work (ATMS 599) as part of meeting the 96 hours of credit required for the Ph.D.

JUSTIFICATION:

The field of Atmospheric Sciences has four core areas in which all students with graduate degrees in Atmospheric Sciences should have expertise. These are dynamic meteorology (the study of atmospheric motions and forces that drive them), physical meteorology (the study of atmospheric thermodynamics, radiative transfer and cloud physics), weather systems (the study of atmospheric storms of various scales), and climate dynamics (the study of climate and climate change). These are taught in our four graduate courses, ATMS 500, 504, 505 and 507 respectively. Our current Ph.D. qualifying exam tests on the subject matter of these four courses.

The purpose of this proposal is to establish requirements that insure that all of our M.S. and Ph.D. graduate students are well educated in these four key areas of our field. Also, following advice from a previous review of our Ph.D. program by the Graduate College, we have been actively working to find ways to reduce the time required for our Ph.D. students to move through our program. A major delay in that process for the students has

been preparation for the qualifying exam. Studying for the exam delays students by several months. By making the four core courses mandatory for all Ph.D. students, we have a means of determining their level of understanding of the material through the normal grading process. This essentially makes the qualifying exam redundant and unnecessary. Many of our peer institutions have already eliminated their qualifying exams, making us less competitive to attract students into our program. Replacing the qualifier with mandatory core courses effectively puts us on a competitive footing with our peers.

In the Atmospheric Sciences, the common path in our and all our peer institutions is for incoming students to obtain an M.S. degree first, and then, if they are qualified, continue on for a Ph.D. It is rare for a student with a B.S. degree to first pursue a Ph.D., unless the student demonstrates exceptional early talent in both academics and research. When developing the proposal, we established Department-level evaluation criteria (that will be published in our graduate student handbook) to determine whether a student should first complete an M.S. degree before pursuing a Ph.D., or go straight from a B.S. to a Ph.D. These criteria will be in force once this proposal is approved. These criteria are stated below.

> "All incoming students with Bachelor's degrees are placed automatically on the M.S. thesis track. Students may petition to the Department Graduate Affairs Committee (GAC) to transfer into the Ph.D. program after the first year of study without completion of an M.S. degree. In such cases, the committee will evaluate the student's academic performance and research potential directly after the student's first full year in the program (at the beginning of the student's second year in the program). The student will also be evaluated on his/her undergraduate academic and research history.
>
> To be eligible to petition into the PhD program with a Bachelor's degree, the student must satisfy the following course requirements: 1) completion of all core courses (ATMS 500, 504, 505, 507) within the first 2 academic semesters of entering the program, and 2) attainment of a minimum GPA of 3.5 for the core courses without receiving lower than a B grade for any core course. No substitutions for core courses from B.S. curricula will be permitted. For students satisfying these course requirements, the GAC will evaluate research potential based on a written research prospectus of no more than 5 pages and an oral presentation of the student's proposed plan of study. The written prospectus must be submitted to the GAC at the end of the student's first year (e.g. August 15, 2016 for a student admitted August 15, 2015). The research prospectus must be written independently by the student and should outline his/her projected PhD research project, including a basic description of background information, any results to date, a projected research plan (including outline of methods), and the perceived impact, novelty and significance of the proposed project. The oral presentation to the GAC should consist of no longer than a 30-minute presentation of the student's research plan. The written research prospectus must be submitted to the department at least 2 weeks in advance of the oral presentation, which will typically be held during the first week of the Fall semester after the student's first full year in the graduate program. The prospectus and presentation are not exams, they are not graded, and they do not take the place of the Preliminary Exam described below in Stage II. Their purpose is to determine if the student should first complete an M.S. degree, or is sufficiently prepared and capable of directly pursuing a Ph.D. degree without the M.S. degree.
>
> The student may petition the GAC only with the consent of his/her academic advisor. The advisor must submit a letter of support for the student to the GAC, and he/she may not serve on the committee considering the petition. In the event that the student's advisor is also a member of the GAC, the Department Head will appoint a faculty member to serve as an alternate committee member for the student. A majority of committee members must vote to support the student's

petition to enter the Ph.D. program. Final approval will be made by the Department Head."

During the Graduate College review the question was asked: "Does the twelve hours of required 500-level coursework included any grade requirement, or if S/U will be acceptable. The Executive Committee recommends that students should be required to pass the core courses with a grade of B or better, but this should be made explicit one way or the other in the proposal." We have added the following statement explicitly in the proposal to clarify the policy:

"All candidates for the Ph.D. degree are required to have completed four courses representing the major subfields within atmospheric sciences. To continue in the Ph.D. program, a student must maintain a minimum grade point average of 3.0 (B) in the core courses (500, 504, 505, 507), while not earning less than a B- in any of these courses. S/U grades are not acceptable in these courses. In the event a student earns a grade lower than a B- in a core course, the student will be allowed one opportunity to retake the course and earn an acceptable grade (B- or better). For the purpose of continuing in the Ph.D. program, the GPA in the core courses will be calculated based on the highest grade earned if a course is retaken."

A second question was asked during the Graduate College review: "Is there still a requirement for the one course students must take per semester until the preliminary exam is passed, or has this option been removed? The proposed program of study seems to indicate that students must still take at least one course per semester before the prelim, but the narrative suggested that the core courses would replace this requirement."

We have eliminated the one course per semester requirement until the preliminary exam is passed. Our reasoning was clarified below in our response to the LAS review:

Finally, we have replaced the ambiguous "Students must take at least one course per semester until preliminary exam is passed" with a specific expectation for how many total academic course credits (not 599 thesis credits) are required by graduation. For example, with the current guideline, an ambitious student could take the prelim right after finishing the core courses and avoid taking other courses, while a student moving more slowly and not taking the prelim early would have to take more courses, slowing the student further. With the new expectation of a specific number of course credit hours, all students have the same requirement, and students can take courses throughout their program as the courses are taught.

A question was raised in the LAS review of the proposal "Without the qualifying exam, what mechanisms exist to inform students that they are (or aren't) making adequate progress in the program?"

The Department has an annual, detailed, individual graduate student review process that occurs each summer. Each student's past progress and following year's plans are evaluated using the following procedure. The student provides a written self-evaluation to the advisor. The advisor then develops a written evaluation of the student based on the self-evaluation, research progress, and complete data on the student's academic progress (grades, publications, awards, exams passed, time in program, financial support etc.). The data are provided by the department. The advisor then discusses the evaluation and recommendations with the student, and all documents from the evaluation are provided to

the Department Head. The Department Head reviews the material, and if any issues concerning adequate progress stand out, has a meeting with the student and advisor to determine the course of action to be taken.

A question was raised in the Senate review of the proposal if a specific list of approved non-ATMS graduate level courses be published in our graduate student guide to standardize what courses are acceptable for credit in our Ph.D. program.

Atmospheric Sciences is a very interdisciplinary science. Professionally, and at in graduate level education, our students draw from many other disciplines and may take courses from Civil and Electrical Engineering, Math, Statistics, Chemistry, Plant Biology, and other disciplines. We prefer that the advisor (with concurrence of the Department Head/Director of Graduate Studies) approve courses acceptable rather than have a list, since these fields rapidly evolve and new courses are introduced all the time that are relevant to our science.

BUDGETARY AND STAFF IMPLICATIONS:

1) Resources
    a. How does the unit intend to financially support this proposal?

        There are no financial consequences of this change. The four core courses are offered every year currently.

    b. How will the unit create capacity or surplus to appropriately resource this program? If applicable, what functions or programs will the unit no longer support to create capacity?

        There is no need to create capacity.

    c. Will the unit need to seek campus or other external resources? If so, please provide a summary of the sources and an indication of the approved support.

        No external resources are required

    d. Please provide a letter of acknowledgment from the college that outlines the financial arrangements for the proposed program.

        There are no financial arrangements required.

2) Resource Implications
    a. Please address the impact on faculty resources including the changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc.

        There are no impacts on faculty resources. The courses mentioned are already offered annually.

b. Please address the impact on course enrollment in other units and provide an explanation of discussions with representatives of those units. *(A letter of acknowledgement from units impacted should be included.)*

   There are no impacts on course enrollments in other units.

c. Please address the impact on the University Library *(A letter of estimated impact from the University Librarian must be included for all new program proposals. If the impact is above and beyond normal library business practices, describe provisions for how this will be resourced.)*

   There are no impacts on the University Library

d. Please address the impact on technology and space (e.g. computer use, laboratory use, equipment, etc.)

   There are no impacts on technology and space.

DESIRED EFFECTIVE DATE: Immediately upon approval

STATEMENT FOR PROGRAMS OF STUDY CATALOG:

Master of Science in Atmospheric Sciences

A student may select either the thesis or non-thesis option. Further information can be obtained from the department's description of the Master's Degree requirements on the Department Website.

Thesis Option

ATMS 500, ATMS 504, ATMS 505, and ATMS 507	16
Additional Graduate-level Courses in ATMS or approved courses in another discipline	8
ATMS 599 Thesis Research (min/max applied toward degree)	8
Total Hours	32

Other Requirements[1]

Other requirements may overlap	
The student is required to write a thesis and give a seminar on his/her thesis research.	
Minimum GPA:	3.0

Non-Thesis Option

ATMS 500, ATMS 504, ATMS 505, and ATMS 507	16
Additional Graduate-level Courses in ATMS or approved courses in another discipline	12
ATMS 596-Non Thesis Research (max applied toward degree):	4
Total Hours	32

Other Requirements[1]

Other requirements may overlap	
The student is required to develop a project in ATMS 596 that focuses on a topic proposed by the student and approved by the department head and present an informal (non-seminar series) talk to a committee.	
Minimum GPA:	3.0

[1] *For additional details and requirements refer to the department's Graduate Programs website and the Graduate College Handbook.*

Doctor of Philosophy in Atmospheric Sciences

All incoming students with Bachelor's degrees only are placed automatically on the M.S. thesis track. Students may petition to the Department Graduate Affairs Committee (GAC) to transfer into the Ph.D. program after the first year of study without completion of an M.S. degree. In such cases, the committee will evaluate the student's academic performance and research potential. The student will also be evaluated on his/her undergraduate academic and research history. To be eligible to petition into the Ph.D. program with a Bachelor's degree, the student must satisfy the following course requirements: 1) completion of all core courses (ATMS 500, 504, 505, 507) within the first 2 academic semesters of entering the program, with a minimum GPA of 3.5 for the core courses without receiving lower than a B grade for any core course, and 2) demonstration of Ph.D. level progress through the student's research. Details of the department evaluation procedure to evaluate student progress and determine if a student can transfer into the Ph.D. program after the first year of study without completion of an M.S. degree can be found in the description of the Ph.D. Degree requirements on the Department Website.

All candidates for the Ph.D. degree are required to have completed four courses representing the major subfields within atmospheric sciences. To continue in the Ph.D. program, a student must maintain a minimum grade point average of 3.0 (B) in the core courses (500, 504, 505, 507), while not earning less than a B- in any of these courses. S/U grades are not acceptable in these courses. In the event a student earns a grade lower than a B- in a core course, the student will be allowed one opportunity to retake the course and earn an acceptable grade (B- or better). For the purpose of continuing in the Ph.D. program, the GPA in the core courses will be calculated based on the highest grade earned if a course is retaken.

All Ph.D. students must pass a preliminary examination based on a written dissertation proposal, and pass a final examination based on the completed dissertation. Further information on course requirements and these examinations can be obtained here: http://www.atmos.illinois.edu/academics/grad_phd.html

Course requirements for students with B.S. directly pursing Ph.D.

ATMS 500, ATMS 504, ATMS 505, and ATMS 507	16
ATMS 599 Thesis Research (min applied toward degree)	16
Additional approved graduate level courses (excluding ATMS 599)	32
Additional approved graduate level courses (including ATMS 599)	32
Total Hours	96

Course requirements for students with M.S. from the Department of Atmospheric Sciences

M.S. Credit transferred to the Ph.D. degree	32
ATMS 599 Thesis Research (min applied toward degree)	16
Additional approved graduate level courses (excluding ATMS 599)	24
Additional approved graduate level courses (including ATMS 599)	24
Total Hours	96

Course requirements for students with M.S. from outside the Department of Atmospheric Sciences

M.S. Credit transferred to the Ph.D. degree	32
ATMS 599 Thesis Research (min applied toward degree)	16
Additional approved graduate level courses* (excluding ATMS 599)	24
Additional approved graduate level courses (including ATMS 599)	24
Total Hours	96

*These courses must include ATMS 500, 504, 505, and 507 if equivalent courses were not taken as part of the student's M.S. degree. Equivalency will be determined by the department after review of the course syllabi.

Other Requirements[1]

Other requirements may overlap	
Qualifying Exam Required	No
Preliminary Exam Required	Yes
Final Exam/Dissertation Defense Required	Yes
Dissertation Deposit Required	Yes
Minimum GPA:	3.0

[1] *For additional details and requirements refer to the department's Graduate Programs and the Graduate College Handbook.*

CLEARANCES:

Signatures:

Unit Representative:	Date: FEB 4, 2015
School Representative:	Date: 2/4/2015
College Representative:	Date: 4/30/15
Graduate College Representative:	Date: 5/27/15

Appendix A: Comparative Table of Proposed Changes

MS Thesis Option			
Current Requirements	**Current Hours**	**Proposed Requirements**	**Proposed Hours**
		ATMS 500, ATMS 504, ATMS 505, and ATMS 507	16
		Additional Courses	8
Thesis Research ATMS 599 (min/max applied toward degree)	4 or 8	ATMS 599 Thesis Research (min/max applied toward degree)	8
Total Hours	32	Total Hours	32
Other Requirements		**Other Requirements**	
The student is required to write a thesis and give a seminar on his/her thesis research.		The student is required to write a thesis and give a seminar on his/her thesis research.	
Minimum Hours Required Within the Unit:	16 (not including 599)		
Minimum 500-level Hours Required Overall in Program:	12	Minimum 500-level Hours Required Overall in Program:	16
Minimum GPA:	3.0	Minimum GPA:	3.0

MS Non-Thesis Option			
Current Requirements	**Current Hours**	**Proposed Requirements**	**Proposed Hours**
		ATMS 500, ATMS 504, ATMS 505, and ATMS 507	16
		Additional Courses	12
Research/Project Hours (min/max applied toward degree):	4	ATMS 596-Non Thesis Research (max applied toward degree):	4
Total Hours	32	Total Hours	32
Other Requirements		**Other Requirements**	
The student is required to develop a project that focuses on a topic in one of three areas and present an informal (non-seminar series) talk to a committee.		The student is required to develop a project that focuses on a topic proposed by the student and approved by the department head and present an informal (non-seminar series) talk to a committee.	
Minimum Hours Required Within the Unit:	16		
Minimum 500-level Hours Required Overall in Program:	12	Minimum 500-level Hours Required Overall in Program:	16
Minimum GPA:	3.0	Minimum GPA:	3.0

Doctor of Philosophy in Atmospheric Sciences			
Current Requirements	**Current Hours**	**Proposed Requirements**	**Proposed Hours**
All candidates for the Ph.D. degree are required to pass a qualifying examination on basic principles of atmospheric sciences. Students have two opportunities to pass the exam.		All candidates for the Ph.D. degree are required to have completed four courses representing the major subfields within atmospheric sciences. To continue in the Ph.D. program, a student must maintain a minimum grade point average of 3.0 (B) in the core courses (500, 504, 505, 507), while not earning less than a B- in any of these courses. S/U grades are not acceptable in these courses. In the event a student earns a grade lower than a B- in a core course, the student will be allowed one opportunity to retake the course and earn an acceptable grade (B- or better). For the purpose of continuing in the Ph.D. program, the GPA in the core courses will be calculated based on the highest grade earned if a course is retaken.	
Course Requirements	**credits**	**Course Requirements**	**credits**
(1) Student must take at least one course per semester (not including 599) until preliminary exam is passed. (credits unspecified) (2) ATMS 599- Thesis Research (min/max applied toward degree) (credits unspecified)	96	**Students completing Ph.D. program without M.S. degree** (1) ATMS 500, 504, 505, 507 (16) (2) Additional approved graduate level courses (excluding ATMS 599) (32) (3) ATMS 599 (16) (4) Additional approved elective graduate level courses (including ATMS 599) (32)	96
		Students completing Ph.D. program after UI ATMS M.S. degree (1) M.S. Credit transferred toward the Ph.D. degree (32) (2) Additional approved graduate level courses (excluding ATMS 599) (24) (3) ATMS 599 (16) (4) Additional approved elective graduate level courses (including ATMS 599) (24)	96
		Students completing Ph.D. program with M.S. degree from another institution (1) M.S. Credit transferred toward the Ph.D. degree (32)	96

		(2) Additional approved graduate level courses*(excluding ATMS 599) * These courses must include ATMS 500, 504, 505, and 507 if equivalent courses were not taken as part of the student's M.S. degree. Equivalency will be determined by the department after review of the course syllabi. (24) (3) ATMS 599 (16) (4) Additional approved elective graduate level courses (including ATMS 599) (24)	
Masters Degree Required for Admission to PhD?— No, but Masters Degree is strongly encouraged before pursuing the Ph.D. Students entering Ph.D. program with MS degree can transfer up to 32 credit hours toward 96 credits required for Ph.D.		Masters Degree Required for Admission to PhD?— No, but Masters Degree is strongly encouraged before pursuing the Ph.D. Students entering Ph.D. program with MS degree can transfer up to 32 credit hours toward 96 credits required for Ph.D.	
Examination Requirements		**Examination Requirements**	
Qualifying Exam Required	Yes	Qualifying Exam Required	No
Preliminary Exam Required	Yes	Preliminary Exam Required	Yes
Final Exam/Dissertation Defense Required	Yes	Final Exam/Dissertation Defense Required	Yes
Dissertation Deposit Required	Yes	Dissertation Deposit Required	Yes
Minimum GPA:	3.0	Minimum GPA:	3.0

Office of the Provost and Vice Chancellor
for Academic Affairs

Swanlund Administration Building
601 East John Street
Champaign, IL 61820

August 5, 2015

Bettina Francis, Chair
Senate Committee on Educational Policy
Office of the Senate
228 English Building, MC-461

Dear Professor Francis:

Enclosed is a copy of a proposal from the College of Liberal Arts and Sciences and the Graduate College to revise the requirements for the M.S. and Ph.D. degrees in Atmospheric Sciences.

Sincerely,

Kathryn A. Martensen
Assistant Provost

Enclosures

c: C. Finnegan
K. Carney
A. Elli
R. Rauber
J. Hart
A. McKinney

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Graduate College

204 Coble Hall
801 South Wright Street
Champaign, IL 61820-6210

RECEIVED
MAY 27 2015
Office of the Provost

May 26, 2015

Kathy Martensen
Office of the Provost
207 Swanlund MC-304

Dear Kathy,

Enclosed please find the proposal to change the department-level requirements for the M.S degree and Ph.D. degree in Atmospheric Sciences.

The proposal was received by the Graduate College on April 30, 2015. It was forwarded to the Executive Committee for review at the May 12, 2015 meeting. The Executive Committee approved the proposal pending clarification regarding two items:

- If the twelve hours of required 500-level coursework has to be graded, or if S/U will be acceptable. The Executive Committee suggested that students should pass the core courses with a grade of B or better.
- If there is a requirement for the one course students must take per semester until the preliminary exam is passed, or whether this remains an option.

The revised proposal addressing the above issues was received and approved by the Graduate College on May 26, 2015.

I send the proposal to you now for further review.

Sincerely,

Cara A. Finnegan
Interim Associate Dean
Graduate College

c: K. Carney
A. McKinney
R. Rauber

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Senate Educational Policy Committee
Proposal Check Sheet

PROPOSAL TITLE (Same as on proposal): Proposal to change the department-level requirements for the M.S. degree and Ph.D. degree in Atmospheric Sciences

PROPOSAL TYPE (select all that apply below):

A. ☒ Proposal for a NEW or REVISED degree program. Please consult the Programs of Study Catalog for official titles of existing degree programs.

1. Degree program level:

   ☒ Graduate ☐ Professional ☐ Undergraduate

2. ☐ Proposal for a new **degree** (e.g. B.S., M.A. or Ph.D.):

   Degree name, "*e.g., Bachelor of Arts or Master of Science*": _____

3. ☒ Proposal for a new or revised **major, concentration, or minor**:

   ☐ New or ☒ Revised **Major** in (name of existing or proposed major): MS and PhD in Atmospheric Sciences

   ☐ New or ☐ Revised **Concentration** in (name of existing or proposed concentration): _____

   ☐ New or ☐ Revised **Minor** in (name of existing or proposed minor): _____

4. ☐ Proposal to rename an existing major, concentration, or minor:

   ☐ Major ☐ Concentration ☐ Minor

   Current name: _____

   Proposed new name: _____

5. ☐ Proposal to terminate an existing degree, major, concentration, or minor:

   ☐ Degree ☐ Major ☐ Concentration ☐ Minor

   Name of existing degree, major, or concentration: _____

6. ☐ Proposal involving a multi-institutional degree:

   ☐ New ☐ Revision ☐ Termination

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

College of Liberal Arts and Sciences
Office of the Dean

2090 Lincoln Hall
702 S. Wright Street, MC-448
Urbana, IL 61801

April 30, 2015

Sarah Lubienski
Interim Dean, Graduate College
204 Coble Hall MC-322

Dear Dean Lubienski:

The Committee on Courses and Curricula, on behalf of the Faculty of the College of Liberal Arts and Sciences has voted to approve the following proposal:

Revision of the MS and PhD in Atmospheric Sciences

Please let me know if you have any questions on this proposal. This proposal is now ready for review by the Graduate College for proposed implementation upon approval.

Sincerely,

Karen M Carney

Karen M. Carney
Associate Dean

enclosure
C: Professor Robert Rauber
Professor Stephen Marshak