INTRODUCTION

The information presented herein is intended to provide Meteorology graduate students basic information about the Meteorology Graduate Program and requirements related to MS and PhD programs, departmental procedures and standards, and financial support.

ISU’s Graduate College Handbook identifies many more resources regarding university procedures, graduate forms, schedules for submission of forms, deadlines, etc. The Graduate College Handbook is available online at www.grad-college.iastate.edu and serves as the most recent version of the handbook.

ISU Graduate Student Resource Websites:

Graduate College: Iowa State University Graduate College
Office of the Registrar: http://www.iastate.edu/~registrar/calendar/homepage.shtml
Electronic Thesis/Dissertations at ISU: Electronic Thesis / Dissertations at Iowa State University
Registration: Registration: Iowa State University
Academic Calendar: Academic Calendars: Iowa State University
Graduate College Forms: ISU Graduate College - Forms
TABLE OF CONTENTS

INTRODUCTION ................................................................................................................................................3

ACADEMIC INFORMATION .............................................................................................................................1

- Admissions Requirements ..........................................................................................................................1
- Registration ..................................................................................................................................................1
- Add and Drop Procedures ........................................................................................................................1
- Forms .........................................................................................................................................................2
- Committee Appointment & Program of Study (POS) .............................................................................2
- Graduate Certificate Forms .....................................................................................................................2
- Graduate Student Request Forms ...........................................................................................................2
- Concurrent Student Request Forms .........................................................................................................2
- Graduation and Thesis Forms ..................................................................................................................2
- Letters of Intent Forms ..............................................................................................................................3
- Nomination for Graduate Faculty ............................................................................................................3
- Graduate Curriculum Forms ...................................................................................................................3
- Miscellaneous Forms ...............................................................................................................................3

GRADUATE COURSES IN METEOROLOGY ....................................................................................................4

GRADUATE ENGLISH REQUIREMENTS ....................................................................................................5

- Non-Native English-Speaking Students .................................................................................................5
- Requirements for Native English-Speaking Students .............................................................................6
- Expectations of Writing Standards for Dissertations, Theses, and Creative Components .................6

ACADEMIC STANDARDS .............................................................................................................................6

- Program of Study (POS) ..........................................................................................................................6
- MS Degree ................................................................................................................................................7
- PhD Degree .............................................................................................................................................7

DEGREE REQUIREMENTS IN METEOROLOGY ...........................................................................................7

- Evaluations and Examinations ................................................................................................................7
- Course, Thesis, and Dissertation Requirements .....................................................................................8

MINOR IN METEOROLOGY ...........................................................................................................................9

FINANCIAL SUPPORT ..................................................................................................................................9

- Assistantships ...........................................................................................................................................9
- Benefits .......................................................................................................................................................10
- Graduate Student Professional Advancement Grants (PAG) ...............................................................10
This handbook is a guide to the graduate program in Meteorology within the Department of Geological and Atmospheric Sciences and provides requirements related to MS and PhD programs, departmental procedures and standards, and financial support.

ACADEMIC INFORMATION

Admissions Requirements
Requirements for full admission in Meteorology are as follows:

Three letters of recommendation. Letters should be from instructors or employers familiar with your academic abilities, at least two letters should be from persons in your major field.

For non-English speaking applicants, a minimum TOEFL (Test of English as a Foreign Language) score of 530 PBT (Paper-based test), 197 CBT (Computer-based test), 79 IBT (Internet-based test), or 6.0 IELTS (International English Language Testing System). Applications will not be processed until the department receives this score.

Statement of purpose describing research interests and future plans. Potential faculty mentors should be identified. Students will be admitted into the graduate program only if a faculty member agrees to serve as mentor.

Applicants with background deficiencies in the chosen areas of graduate study may be admitted on a provisional basis. Students may be granted full admission status upon overcoming the deficiency and subject to approval by the Atmospheric Science faculty and the Graduate College (usually after one or two semesters).

The GRE (Graduate Records Examination) for the verbal, quantitative, and analytical areas are highly recommended, but not required.

Students entering the PhD program must have an MS degree from a university considered by the faculty to have an academically strong program. Otherwise the student will be enrolled in the MS program.

Students must petition for formal enrollment in the PhD program. The faculty will review petitions and notify students in writing of their decision. For successful petitioners, the letter of acceptance will include tentative dates for taking the PhD Preliminary Examination.

Continuing students in the Meteorology graduate program who complete an MS degree will petition by sending to the Professor-in-Charge a brief memo (one or two sentences) requesting PhD enrollment. The petition must be submitted within three months after their MS advisor signs documents signifying successful completion of all MS degree requirements.

For students entering the Meteorology graduate program after completing an appropriate MS elsewhere, their application for admission will be considered the petition.

Registration
You and your major professor or temporary advisor will handle your initial registration. To register for classes, new students must first obtain an ISUCard and establish an AccessPlus account.

All students who attend classes at ISU must register and pay assessed tuition and fees. The ISU Schedule of Classes is the official source of information about registration and fee payment for all students at ISU and may be found on the Office of Registrar’s website. Registration for summer session should be completed during the spring, at the same time as registration for fall semester.

Add and Drop Procedures
Note: deadlines apply for registration and schedule changes, as well as cancelling and withdrawing from classes. Students are responsible for knowing these deadlines.
Procedures for schedule changes vary by the time period of the semester. The effective date of a schedule change is the date on which the change is entered into the registration system.

**Forms**

Many of the forms graduate students will need during their tenure at Iowa State are available for download in WORD or Excel formats from the Graduate College website as listed below:

**Committee Appointment & Program of Study (POS)**
- Committee Appointment Form
- Request to Change Committee Appointment Form
- Program of Study (POS) Form
- Modifications to the POS Form
- POS (Supplement) Form

**Graduate Certificate Forms**
- Certificate Completion Form
- Request to Pursue a Certificate in Addition to a Graduate Degree
- Request to Pursue a Graduate Degree in Addition to a Certificate

**Graduate Student Request Forms**
- Add a Co-Major
- Audit(s) to Appear on Transcript
- Application for Summer Resident Tuition
- Double Graduate Degree Program
- Graduate English Requirement Approval
- Home Department for Students Admitted to Interdepartmental Majors
- Loan Deferment Form
- Masters Student on PhD Track in Same Department
- New Department for Students Formerly Admitted to Botany, Microbiology, Zoology and Genetics
- Reinstatement to Active Status
- Retain a Previously Declared Major
- Transfer From One Major/ Program/ Department To Another
- Transfer From One Major/ Program/ Department to Nondegree

**Concurrent Student Request Forms**
- Concurrent Enrollment for Graduate/ Undergraduate Degrees
- Concurrent Enrollment for Graduate/Veterinary Medicine Degrees
- Transfer of Courses for Concurrent B.S./Graduate
- Transfer of Courses for Concurrent VM/Graduate
- Two Concurrent Graduate Degrees
Graduation and Thesis Forms
Application for Graduation (Diploma Slip)
Thesis / Dissertation Submission Form
Electronic Thesis / Dissertation Submission Checklist
Graduation Check for MBA and MArch Students

Letters of Intent Forms
Graduate Assistantship Letter of Intent
Graduate Assistantship Benefits, Fees, Reappointment and Termination
Nonimmigrant Work Understanding Form
Postdoctoral and Predoctoral Appointment Letter of Intent

Nomination for Graduate Faculty
Term Graduate Faculty Nomination Form

Graduate Curriculum Forms
Procedures for Obtaining Approval for a Concurrent Undergraduate Degree and a Graduate Certificate
Propose a New Program or Major
Propose Dual-Listed Courses
Proposal for Obtaining Concurrent Undergraduate and Graduate Degrees Form
Proposal for Beginning a Graduate Certificate Form
Proposal Instructions for Adding New or Changing an Area of Specialization in a Graduate Degree

Miscellaneous Forms
AGEP Nomination Form
AGEP Purchase Request
George Washington Carver Doctoral Fellowship Nomination Form
GMAP Nomination Form for New Students
GMAP Nomination Form for Current Students
Graduate Tuition Scholarship Nomination Form
Human Subjects Forms
Professional Advancement Grant (PAG) application
SEVIS Fee Form
Graduate forms not available for download can be obtained in the Departmental Office in 3010 Agronomy Hall, as listed below:
Request for Preliminary Exam
Request for Final Oral Exam
Other university forms are available at http://www.ats.iastate.edu/forms.html as categorized below:
Accounting, Payroll
Office of Sponsored Programs Administration
**GRADUATE COURSES IN METEOROLOGY**

**Mteor 504. Global Change.** (Dual-listed with 404). (Cross-listed with Agron, EnSci). (3-0) Cr. 3. S. 
*Prereq: Four courses in physical or biological sciences or engineering; junior, senior, or graduate standing.* 
Recent changes in global biogeochemical cycles and climate; models of future changes in the climate system; impacts of global change on agriculture, water resources and human health; ethical issues of global environmental change.

**Mteor 505. Environmental Biophysics.** (Dual-listed with 405). (Cross-listed with Agron, EnSci). (3-0) Cr. 3. Alt. S., offered 2009. 
*Prereq: Math 166 or equivalent.* 
Hornbuckle. The physical microenvironment in which organisms live, with an emphasis on the processes of energy and mass (water and carbon) exchange between organisms and their environment and the quantitative models that are used to represent these processes. Temperature, water, and wind. Heat, mass, and radiative transport. Applications to animals, plants, and plant communities. Semester project required.

*Prereq: Math 166 and Mteor 454.* 
Gallus. The physical nature and practical consequences of mesoscale atmospheric phenomena. Mesoscale convective systems, fronts, terrain-forced circulations. Observation, analysis, and prediction of mesoscale atmospheric structure. Semester project and in-class presentation required.

**Mteor 511. Synoptic Meteorology.** (Dual-listed with 411). (1-4) Cr. 3. F. 
*Prereq: Credit or enrollment in 454.* 
Current weather forecasting and discussion. Applications of atmospheric physics and dynamics in real-time weather situations. Use of UNIDATA computer products.

**Mteor 516x Hydrologic Modeling and Analysis.** (Dual-listed with 416x). (2-3) Cr. 3. Alt. S., offered 2009. 
Study of basic principles of hydrologic modeling, including rainfall-runoff analysis, input data, uncertainty analysis, lumped and distributed modeling, parameter estimation and sensitivity analysis, and the use of models in applied hydrology. Practice implementing a range of common models, to study hydrologic topics such as flood forecasting and land use change.

**Mteor 517. Mesoscale Forecasting Laboratory.** (Dual-listed with 417). (1-5) Cr. 3. S. 
*Prereq: Credit or enrollment in 411.* 
Real-time computer analysis of current weather, with emphasis on small-scale features. Studies of severe weather, lake-effect snow, CSI, cold-air damming.

*Prereq: Math 265 or equivalent or permission of instructor.* 
Hornbuckle. Microwave remote sensing, both passive (radiometry) and active (radar), as it applies to Earth's surface and atmosphere. Overview of relevant electromagnetic theory and antenna theory. Planck emission and the radiative transfer equation. The electrical properties of natural media (atmosphere, soil, and vegetation) at microwave frequencies. Atmospheric sounding, remote sensing of soil and vegetation water content, data inversion, and data assimilation.

**Mteor 532. Instrumentation and Measurements.** (Dual-listed with 432). (3-0) Cr. 3. S. 
*Prereq: Credit or enrollment in Stat 105, Math 266, Phys 222.* 
Measurement of meteorological variables and instruments used, including surface, upper air, and remote sensors; measurement errors, signal processing, recording and archiving; quality assurance.
Mteor 542. **Physical Meteorology.** (3-0) Cr. 3. Alt. F., offered 2009. **Prereq: 342, Math 266, Phys 222.** Planetary atmospheres, radiative equilibrium models, radiative transfer, the upper atmosphere, remote sounding from satellites.

Mteor 543. **Advanced Dynamic Meteorology I.** (3-0) Cr. 3. Alt. F., offered 2010. **Prereq: 455.** The first half of a two semester sequence. Governing equations, scale analysis, simple types of wave motion in the atmosphere, instability theory.


Mteor 552. **Physics of Climate.** (Dual-listed with 452). (2-3) Cr. 3. **F. Prereq: Mteor 342 and Mteor 443.** Exploration of the fundamental physical principles that govern the climate systems of the earth and other planets. Emphasis on coupled, nonlinear-system interactions of physical processes such as circulation dynamics, radiative transfer and cloud/precipitation physics, starting with fairly simple 0- and 1-dimensional analytical and numerical models based on energy, mass, and momentum conservation. Observational study of seasonally evolving weather patterns that form climates around the world.

Mteor 561. **Geophysical Fluid Dynamics.** (3-0) Cr. 3. Alt. F., offered 2009. **Prereq: 455 or EM 378 or M E 335 or Phys 361.** Basic concept of rotating fluid dynamics, governing equations and boundary conditions, dynamics of vorticity, potential vorticity and geostrophic motion, wave motion in a rotating system, dynamics of Ekman and Stewartson layers, ocean circulation.

Mteor 571. **History of Modern Meteorology.** (Dual-listed with 471). (1-0) Cr. 1. Alt. S., offered 2010. **Prereq: Mteor 341, 342, 411, 443, 455.** Development of meteorological theories and numerical weather prediction, discoveries of important meteorological phenomena, and impact of weather and climate on important historical events.

Mteor 590. **Special Topics.** Cr. 1-3. Repeatable. **Prereq: Permission of instructor.** Topics of current interest.  
A. Boundary-layer Meteorology  
B. Tropical Meteorology  
C. Mesoscale Meteorology  
D. Global Climate Systems  
E. Climate Modeling  
F. Numerical Weather Prediction  
G. Satellite Observations  
H. Statistical Methods in Meteorology  
I. Field Observations  
J. Low Frequency Modes  
K. Cloud Physics  
L. Atmospheric Radiation  

Courses for graduate students

Mteor 605. **Micrometeorology.** (3-0) Cr. 3. Alt. F., offered 2007. **Prereq: 443.** Atmospheric boundary layer, structure and dynamics. Turbulence, soil influences, measurements and empirical relations for wind and temperature profiles near the ground. Simulation of boundary layer structure and dynamics.

Mteor 699. **Research.** Cr. arr. Repeatable

**GRADUATE ENGLISH REQUIREMENTS**

**Non-Native English-Speaking Students**
Non-native English speakers are required to take the English Placement Test their first semester at Iowa State. (If they already have received a degree from a US university, they take the graduate English exam for non-native a speaker, which only involves writing a composition in English.) Both tests are
administered by the English Department. **Notices announcing testing dates and locations will be posted on the student bulletin board on the 3rd floor of Agronomy Hall.**

For more information, contact the English as a Second Language (ESL) secretary in the English Department at 294-3568. Students receiving low scores on these tests are assigned to appropriate sections of English 101. These courses should be completed during the first year of graduate study.

In addition, non-native English speakers who wish to teach at ISU must take the SPEAK/TEACH tests before beginning their teaching duties. Teaching opportunities depend upon the level of proficiency achieved on these tests. Students with low scores on SPEAK/TEACH are required to enroll in the appropriate sections of University Studies/English 180 if their teaching responsibilities will involve interaction with undergraduates.

**Requirements for Native English-Speaking Students**

Iowa State does not test native English speakers for English skills. Use of the English language is expected to improve for all students as they progress toward their degrees. Students are expected to seek out opportunities for oral and written presentations and, if needed, to take formal coursework in these areas.

**Expectations of Writing Standards for Dissertations, Theses, and Creative Components**

A dissertation, thesis, or a creative component submitted as partial requirement for the MS and PhD degrees is expected to be professionally written and of quality expected for publication in a leading scientific journal. It is the responsibility of the student to ensure that drafts of the dissertation, thesis, or creative component be of a high standard; it is not the duty of the major professor to correct poorly written drafts.

Iowa State University began requiring all Theses and Dissertations to be electronically submitted in the Fall 2006. All students whose programs of study require a Thesis or Dissertation must comply with all Iowa State thesis requirements in order to graduate. Guidelines, resources, forms, and deadlines are available at [http://www.grad-college.iastate.edu/thesis/homepage.html](http://www.grad-college.iastate.edu/thesis/homepage.html).

**ACADEMIC STANDARDS**

Graduate students failing to maintain a cumulative 3.0 grade point average on all course work taken, exclusive of research credit, are placed on academic probation by the Graduate Dean. Grades earned by graduate students in undergraduate courses are included in calculating the grade point average.

A student on academic probation cannot be admitted to candidacy for a degree and usually will not be appointed to an assistantship. The Graduate College places a hold on future registration pending a review by the Department each semester on probation.

A student must complete all courses listed on the Program of Study with a "C" (2.0) or above and have an overall 3.0 average, unless an exception is recommended by the student's committee and approved by the Graduate Dean, before being approved for graduation.

In order to remain eligible to receive financial aid from student aid programs, a student must meet both qualitative and quantitative academic standards. Qualitative standards refer to minimum expectations of academic performance in coursework; quantitative standards refer to limits on the number of semesters in which enrollment is permitted in combination with a minimum number of credit hours to be earned per year. The Student Financial Aid Office can provide more details.

**Program of Study (POS)**

A POS Committee provides programmatic oversight for the graduate student and suggests courses necessary for a student's area of specialization. The POS Committee ensures departmental and university requirements are met. Students are encouraged to establish a POS Committee as soon as the major professor is selected by filing a Recommendation for Committee Appointment form with the Graduate
College. The student normally forms a POS Committee by the end of the second semester of graduate study.

The POS is signed by the student, committee members, and the Director of Graduate Education (DOGE) for the Meteorology graduate major before being submitted to the Graduate College. When the Graduate College has approved the POS, one copy is returned to the student, one to the major professor, and one to the department.

All changes in an approved POS must be made in writing to the Graduate College with the agreement of the student, major professor, and the chair of the department. Major changes, such as course substitution, changing from thesis to non-thesis, or vice versa, and deletion or addition of a declared minor, require POS Committee concurrence and the signature of the DOGE and the Graduate College.

The following requirements have been established by the Graduate College and the Department of Geological and Atmospheric Sciences for membership of a POS Committee:

**MS Degree**
The POS Committee has at least three members.

Two members are from the Meteorology faculty of the Department of Geological and Atmospheric Sciences, and at least one member is from outside of the department.

All committee members must belong to the graduate faculty of the university.

If a minor is being pursued by the student (e.g., Water Resources), a member of the advisory committee associated with the minor (see ISU General Catalog) must also be on the POS Committee.

**PhD Degree**
The POS Committee has at least five members.

All members of the POS Committee, including the major professor, must be members of the graduate faculty.

At least three POS Committee members are from the Atmospheric Science (Meteorology) faculty of the Department of Geological and Atmospheric Sciences.

One Committee member must be from outside the Department of Geological and Atmospheric Sciences.

If the student is pursuing a minor (e.g., Water Resources), a member of the advisory committee associated with the minor (see ISU General Catalog) must also be on the POS Committee.

**DEGREE REQUIREMENTS IN METEOROLOGY**

**Evaluations and Examinations**

**Diagnostic Entrance Evaluation.** The atmospheric science faculty will provide a diagnostic evaluation of all graduate students entering the MS and PhD programs who do not have an MS degree in Meteorology from a US or Canadian institution. The purpose of this evaluation is to assess the level of understanding of fundamental meteorology at the senior undergraduate level in the following four areas: dynamic meteorology, thermodynamic and physical meteorology, synoptic meteorology, and general meteorology. Before the student’s first semester of enrollment, the faculty will evaluate transcripts, work experience, internships, and other evidence of academic and practical experience relating to these areas. The student may be interviewed by a committee appointed by the professor-in-charge to examine more fully the content of previous course work and experiences. The student should be prepared to submit samples of previous work (undergraduate thesis, term papers, problem solutions, research summaries, etc.) as supporting evidence of competence in the areas under evaluation.

On the basis of this evaluation, a set of required courses and experiences will be established for each student. This normally will consist of a specific set of undergraduate material, including parts or all of
undergraduate courses and may include enrollment in undergraduate courses in mathematics, physics, computer science, or statistics. The student will enroll in Meteorology 490, with the number of credits determined by the faculty on the basis of the amount of required remedial work. At midterm of the first semester, the committee will meet to evaluate progress on mastering the remedial material and report to the student the performance expected through the remainder of the semester. At the end of the semester the committee will issue a letter grade on the student’s performance in Meteorology 490. The student must earn B or better (not B-) in Meteorology 490 and in all courses required under the diagnostic entrance evaluation. A grade below B (B- or lower) in any remedial course (including Meteorology 490) may lead to dismissal from graduate enrollment.

**PhD Preliminary Examination.** The PhD preliminary examination provides an evaluation of the student’s working knowledge of graduate course material and certifies that the student is suitably prepared to advance to the research component of the PhD program. This examination must be taken before the end of the third semester in the PhD program, and it covers dynamic meteorology and physical meteorology. Physical meteorology includes atmospheric radiation, cloud physics, convective processes, surface energy budgets, and global energy balance. Students must pass both a general dynamic/physical component and a component specific to each student’s specialization that is determined in consultation with the major professor. Students will receive one of the following grades in each of these two areas: Pass, Provisional Pass, Fail.

**Pass:** Indicates the student has sufficient working knowledge of this area to advance to the research component.

**Provisional Pass:** Indicates the student has a deficiency in this area that can be remedied by means of a special arrangement, such as solving a collection of problems on a particular topic, doing special studies (such as a brief research paper) under one of the faculty, or grading problems in the particular class relating to the deficiency. Requirements for remedying this deficiency must be completed in the semester that the exam is taken.

**Fail:** Indicates the student must terminate his or her PhD program in Meteorology.

**Course, Thesis, and Dissertation Requirements**

**MS students:** Course requirements for the MS degree include MTEOR 542, 543, 507 or 518, 552 or 516, and 502 or 504 or 505 or 605. In addition to the 5 required courses from this list, students must take at least 3 more credits of graduate course work in Meteorology, Agricultural Meteorology, or a field related to their research interests (students will work closely with their POS committee to determine the exact amount of structured course work required – typically this is 18-21 credits). Students without prior synoptic meteorology course work must complete MTEOR 511 and may substitute these credits in place of the required MTEOR 507 or 518 courses.

All graduate students are expected to be participants in regular and special Meteorology seminars. Part of the grade for students enrolled in MTEOR 699 will be determined by seminar attendance.

MS students must satisfactorily repair any deficiencies revealed by the diagnostic entrance evaluation.

Upon completion of requirements prescribed by the diagnostic evaluation, the student, with help from the major professor shall prepare a thesis or creative component prospectus that outlines the research to be undertaken for the MS degree. The prospectus should be of sufficient depth and length to demonstrate that the student has read the scientific literature relevant to the problem, understands the nature of the problem, and understands the computational and statistical procedures required to advance scientific understanding of the issue. This prospectus should be written in the style of a paper written to a scientific journal of the American Meteorological Society and will be submitted as an oral presentation to the POS committee for subsequent modification by the student.

Upon completion of the research outlined in the prospectus as modified and approved by the POS committee, the student will write a thesis or creative component presenting research results in the form of a scientific paper suitable for submission to one of the major journals in the field. [Note that formatting of
the thesis must follow guidelines set by the Graduate College. The student also will defend his or her research in a final oral examination. The first part of this examination will be a public seminar on the thesis or creative component topic. This will be followed by a period in which the degree candidate will be examined in more detail by the members of the POS committee.

**PhD students** must satisfactorily repair any deficiencies revealed by the diagnostic entrance evaluation.

Applicants for the PhD program are expected to hold an MS degree from a university considered by the faculty to have an academically strong program.

Course requirements for the PhD degree include at least 12 credits of structured coursework beyond the courses required in the 5 core areas required for the MS degree and in addition to courses taken as an MS student. At least 3 of these credits must be taken in a course outside meteorology or agricultural meteorology. Some or all of the core area course requirements may be waived by the faculty if the student has already taken a comparable course elsewhere and/or has evidenced thorough understanding of the subject matter.

All graduate students are expected to be participants in regular and special Meteorology seminars. Part of the grade for students enrolled in MTEOR 699 will be determined by seminar attendance.

By the end of the third semester in the PhD program, the student will take the preliminary written examination. Students must pass both a general dynamical/physical component and a component specific to each student’s specialization that is determined in consultation with the major professor.

Upon passing both components of the PhD preliminary written examination, the student, within two semesters and with help from the major professor, shall prepare a dissertation prospectus that outlines the research to be undertaken for the PhD degree. The prospectus should be of sufficient depth and length to demonstrate that the student has read the scientific literature relevant to the problem, understands the nature of the problem, and understands the computational and statistical procedures required to advance scientific understanding of the issue. This prospectus should be written in the style of a paper written to a scientific journal of the American Meteorological Society and will be submitted as an oral presentation to the POS committee for evaluation and subsequent modification by the student.

Upon completion of the research outlined in the prospectus as modified and approved by the POS committee, the student will write a dissertation presenting research results in the form of one or more scientific papers suitable for submission to major journals in the field. [Note that the formatting of the thesis must follow guidelines set by the Graduate College. The student also will defend his or her research in a final oral examination. The first part of this examination will be a public seminar on the dissertation. This will be followed by a period in which the degree candidate will be examined in more detail by the members of the POS committee.

**MINOR IN METEOROLOGY**

The department offers a minor in Meteorology which may be earned by completing a total of 15 credits of coursework, including no more than 6 credits of 300 or 400 level Meteorology along with any course numbered above 500. Courses must be chosen in consultation with a meteorology POS committee member.

**FINANCIAL SUPPORT**

**Assistantships**

Upon your acceptance into the graduate program you should have received information about funding that is available. The Meteorology Program has a limited number of assistantships available (the number will vary from year to year). Many students are supported by research grants from their major professor. All assistantships in this department are Research Assistantships (RA), meaning that you are being paid for the research you conduct. The assistantship qualifies you as a C-base employee. Other benefits include scholarship credit towards your tuition (in-state status with tuition paid by the Major Professor or
department), enrollment in the student health insurance plan. The assistantship is considered to be a half-time position and you are required to work at least 20 hours a week, maintain a 3.0 grade point average, and take 9 credits in both the fall and spring semesters and 5 in the summer session. However, you may very well work far more hours on a weekly basis in order to complete your research and complete your degree.

Teaching assistantships (TA) are available from the department on a competitive basis for students admitted on a full-time basis. TAs start at $1,461 per month for a ½-time appointment or $13,149 for 9 months. Additional RA support may be available during the summer.

A half-time TA generally requires 20 hours per week of assistance in preparation, teaching, and grading for lectures and laboratories in undergraduate courses. To be eligible for a TA, a student must have very good teaching and English-speaking skills. Teaching duties are usually assigned by the Professor-in-Charge based on class schedules, previous experience, and consensus of the faculty.

Research assistantships are offered to students qualified to assist faculty members holding sponsored research grants. The work required of the RA generally leads to thesis or dissertation research.

Summer research assistantships may be available on a part- or full-time level. Students on summer assistantships must register for at least 5 credits.

Additional support is normally provided for graduate students holding an assistantship. An MS student on full admission with a ¼-time assistantship receives a Graduate College Scholarship equal to ¼ of the resident tuition, and those with a ½-time or greater assistantship receive a Graduate College Scholarship equal to ½ of the resident tuition. PhD students on a ½-time or greater assistantship receive scholarship credit equal to 100% of the resident tuition (effective Fall 2006). Non-resident students on appointment normally receive a Tuition Scholarship equal to the difference between resident and non-resident rates, in addition to the Graduate College Scholarship.

New students wishing to apply for financial assistance for the coming academic year should do so as early as possible but before February 1 for the following Fall Semester. Offers of financial assistance will generally be made in early March, and acceptance or rejection of the offers by the prospective student is normally required by April 15.

A few appointments may become available during the academic year. Students graduating at mid-year who qualify for financial support may begin graduate study in the Department of Geological and Atmospheric Sciences in mid-year.

Benefits

Insurance: All C-base graduate assistants (TAs and RAs) receive single student medical insurance coverage free of charge under the ISU Student Health Insurance Plan. For more information, please consult the Graduate Student Handbook.

Holidays: All employees, regardless of appointment base, are not required to be at school during official holidays, which include New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and the Friday after Thanksgiving, Christmas, and two additional days each year determined by the ISU President and Administration.

Graduate Student Professional Advancement Grants (PAG)

Travel PAGs may be granted to students who attend a professional meeting, defined as a gathering of an organized society of professionals for the purpose of presenting research papers. Travel PAGs may also be approved for attending professional workshops that provide hands-on experience not available at ISU.

Travel PAGs will not provide funding for required academic activities as defined in GSS Bill 93-06, including workshops, classes or other events required for fulfillment of a student's degree requirements or program of study. Travel PAGs are divided into two categories depending on the student's involvement at the meeting: Presenting Author, Non-Presenting Author, or Non-Presenting/Non-Author. To qualify for a
Presenting Travel PAG, the student must present results of research performed at ISU at the professional meeting. These categories are described in detail in GPSS Bill S06-04 [Appendix].

**GRADUATE COLLEGE HANDBOOK**

The Graduate College Handbook is an ever-changing document due to updates in university policies and programs. This on-line version will contain the latest updates of the Handbook so you can have easy access to the most current information.

**FACULTY RESEARCH**

**T.-C. (Mike) Chen**

Dr. Chen’s primary research covers a wide range of subjects: (1) intraseasonal to interdecadal variability of climate system, (2) global and regional hydrological and energy cycle, (3) tropical meteorology and monsoon, and (4) North-American regional climate including the scale-interaction between large scale circulation and low-level jet. These research efforts use not only the NCEP/NCAR and NASA/GEOS reanalysis data, but also the global climate model and regional MMS model developed at NCAR, and the Goddard global data assimilation system. NSF and NASA provide the major funding sources of these research efforts. Several graduate students, postdoc, visiting scientists and scientists from Goddard Space Flight Center, NCAR, and NCEP are involved in different tasks of my research activity.

**KRISTIE FRANZ**

Dr. Franz's research focuses on improving the modeling and forecasting of watershed scale processes. An emphasis of the research is the analysis and evaluation of various snowmelt models and their utility for predicting spring streamflows. The work includes testing and development of advanced verification statistics for ensemble streamflow forecasts. Other research interests are the application of remote sensing data and new data products in hydrology and forecasting, and the use of climate and weather forecasts in hydrologic prediction.

**William A. Gallus, Jr.**

The research of Dr. Gallus primarily concerns improving weather forecasting through increased understanding and better modeling of mesoscale weather systems. In particular, the research emphasizes improved prediction of warm-season rainfall, which can involve ensemble creation, modification of parameterizations, better understanding of land-surface interaction with the lower troposphere, and use of statistical tools such as neural networks. Additional research interests include better use of weather data to assist winter maintenance decisions by transportation agencies, and design of innovative pedagogical tools for geoscience education.

**William J. Gutowski, Jr.**

Dr. Gutowski’s research concentrates on the role of atmospheric dynamics in climate. Central focuses are the dynamics of the hydrologic cycle and regional climate. Because processes on a wide range of spatial and temporal scales are important for both of these, his research program entails a variety of modeling and data analysis approaches: numerical simulation to understand surface-atmosphere coupling in the water cycle, analysis of observed water flow in the atmosphere, and improved computation of water transport in numerical models. His work includes regional modeling of North American, African, Arctic and East Asian climates and he has had significant collaboration with scientists in these regions. Much of his work is through the Earth Systems Simulation Laboratory and its primary activity, the Project to Intercompare Regional Climate Simulations (PIRCS), which he coordinates with Dr. Eugene Takle and Dr. Ray Arritt (Agronomy Department). His research also involves collaboration with applied numerical mathematicians and hydrologists at other institutions, most notably Indiana University, University of New Hampshire, the U.S. Geological Survey and the National Center for Atmospheric Research.
As part of his African research, Dr. Gutowski has made substantial effort to foster a regional climate modeling community in Africa, primarily in collaboration with Prof. Bruce Hewitson of the University of Cape Town (UCT) and colleagues at the International Centre for Theoretical Physics (ICTP; Trieste, Italy). Part of this effort has been research collaboration. However, this work also has included organizing and participating in training workshops, mentoring African graduate and postgraduate students, hosting student visitors from UCT and a sabbatical stay at UCT. He currently is exploring ways to use the Internet for collaborative education with multiple institutions in Africa.

**Eugene S. Takle**
Dr. Takle’s research program includes modeling weather and climate at the mesoscale and microscale. Mesoscale research problems include sensitivity of regional climate to land use and remote forcing. Turbulent flow through vegetation is simulated with microclimate models, which present opportunities to evaluate the interaction of plants, soil, and atmosphere in heterogeneous agro-ecosystems.

**Xiaoqing Wu**
Dr. Wu’s research focuses on the fundamental understanding of convection, clouds, and cloud-radiation interaction, the physical parameterization of these sub-grid-scale processes in large-scale models, and the role of cloud systems in climate. Both fine-resolution cloud-resolving models (CRM) and coarse-resolution general circulation models (GCM) are essential tools to the project. Various approaches including the diagnostic, semi-prognostic, analytic, and statistic analyses are used to synthesize the observed datasets and modeled outputs for investigating the complicated relationship among the large-scale dynamics, cloud dynamics, cloud microphysics, radiation, and surface processes.

**UNIVERSITY SERVICES**

**AccessPlus**
AccessPlus is a secure and personalized online resource for accessing important and confidential university information and web applications. AccessPlus is available day or night, seven days a week, from anywhere in the world. To login to AccessPlus, all you need is your Social Security Number or University ID, and your university PIN. Once inside AccessPlus, tabs and menus are customized to meet specific needs. For example, only registered students can view their current course schedule. AccessPlus offers a wide range of services from changing your address and managing your CyCash account, or even paying your university bill online. Some of the other many services available for students through AccessPlus include class registration, class schedules, financial aid, grade reports and transcripts, job board, and residence halls and dining.

**Internet Access**
When you arrive at Iowa State, you will need to register for a personal Network-ID and e-mail account on Project Acropolis. Your university email address is the same as the Net-ID you are assigned upon entering the university. For example, if your Net-ID is "jdoe", your email address is "jdoe@iastate.edu". You can do so at the Solution Center, Room 195 Durham Center (open 8 AM – 5 PM Monday through Friday, 294-4000 or solution@iastate.edu). You must have an ISU ID card to register for e-mail. If a student withdraws or graduates, his/her e-mail account remains active until the 18th day of classes in the following fall or spring semester.

All departmental- and university-related e-mail correspondence will be sent to your university address.

**ISU Identification (ID) and Social Security Number (SSN)**
ISU IDs (also known as the ISU Card) are available from ISUCard Office, Room 0530 Beardshear (294-2727). Pictures are taken Monday thru Friday, from 8:00AM to 4:15PM (during regular business hours). Students, faculty, staff, and retirees all receive their first ISUCard for free. Affiliates (including spouses) of the University will be charged an annual fee of $10. Replacement of lost ISUCards will cost students $20, while faculty and staff can obtain one free replacement for lost, stolen, or damaged cards each fiscal year.
The free replacement for everyone uses the photo already on-file, while a $20 fee is charged for retaking an individual's photo.

**Keys**

Obtain a Key Request Form from the Student Services office in Room 1126. Your major professor will advise you which keys you will need and sign your form. Submit the completed form to 1126 or 2101 Agronomy. Within 24 hours of submitting the form, you will receive a Key Card to sign and submit to the Key Desk in the General Services Building where you may pick up your key(s). Keys usually are ready for pick up at 10 AM the day after the request is processed.

Before students leave the university, all keys must be returned to the Key Desk in the General Services Building or alternate arrangements must be made with the FP&M key coordinator. Students not returning keys or making arrangements at termination will be assessed $20 for each key. For security reasons, failure to return keys may require rekeying of a room or rooms at a cost to be paid by the individual or by the department.

**Mail Boxes**

You will have a mailbox in the Meteorology Teaching Office in 3010 Agronomy Hall where you will receive important notices about department activities and programmatic matters. Because this mailbox is an important means of communication, you should check it at least twice a week for notices, handouts, letters, and other messages.

**Office Space**

New students are assigned a desk by the Meteorology Professor-in-Charge.

**Photocopying in Agronomy Hall**

Agronomy Departmental photocopy machines are located in Rooms 1502, 2011, and the north end of 3020, and are installed with a copy guard. A Meteorology Program photocopy machine is also located in the south end of 3020 and should be used when possible.

**Research-Related Photocopies:** Students on research assistantships should obtain a photocopy account code from their major professor.

**Personal Photocopies:** You may purchase an assigned copy numbers or have value added to an existing one from Mary Davis in Room 2 using either cash or a check. All users must pay for personal copies in advance. You will be assigned a copy number. Personal accounts will be credited and users will be able to make copies until the credit is depleted. As copies are made, the copy machine will indicate the number of copies remaining.

**Sexual Harassment Policy**

The Department of Geological and Atmospheric Sciences emphasizes and reaffirms its commitment to maintaining a working and learning environment free from sexual harassment. Anyone who believes that she or he has been subject to sexual harassment may elect to proceed informally by bringing the complaint directly to the attention of an appropriate administrator, or by filing a complaint with the Office of Equal Opportunity and Diversity. Information about the University’s sexual harassment policy and resolution procedures is available at from the Dean of Student’s Office, the Student Counseling Service, or the Margaret Sloss Women’s Center.

**Student Accident Reporting**

ISU’s Thielens Student Health Center (corner of Sheldon and Union Drive) provides emergency medical services to students who sustain injuries while in academic classes or events sponsored by the University, which are within the campus or the general surrounding areas. Services rendered will be the responsibility...
of the individual student, either personally or through a health insurance program. Instructions for downloading and completing the Student Accident Report form.

Supervisors who have Student Workers who sustain injury in the course of and arising out of their employment with ISU should fill out the First Report of Injury to report a workers compensation incident and send to Shelly Evangelou, Room 2101 Agronomy Hall, within 24 hours of injury. For additional information see the section in the guide on: Workers’ Compensation Work Related Injuries and Illnesses

**Student Legal Services (SLS)**

SLS is a legal aid office available to any student currently enrolled at Iowa State University. Registered student groups are also eligible for services. SLS is staffed full time by practicing attorneys. Students may make appointments by calling 294-0978 or by stopping in 0367 Memorial Union.

**Transportation and Parking**

Students and graduate assistants are not eligible for general staff or reserve permits.

ISU Parking Systems subsidizes passes for students, staff, and faculty members who live in Ames to ride CyRide. The subsidized passes are available through the mail, at University Bookstore, or at the CyRide office.

Students and graduate assistants who live outside the corporate city limits of Ames obtain parking permits, when available, for lots designated for commuter students.

Students and graduate assistants who live within the corporate city limits are not eligible for on campus permits. Students with special needs should contact the DPS Parking Division office.

Any student may park a vehicle at the Iowa State Center Lots and the shuttle bus (CyRide) to campus. These lots are available Monday through Friday for free. No overnight parking is allowed. For more information visit the CyRide webpage.

Also, Monday through Friday after 5:30 PM and on the weekends most on-campus lots are open for anyone to use them (lot signs should be read carefully).

**Travel Authorization**

Students on assistantship who leave the state of Iowa during normal school session must fill out an Out-of-State Travel Authorization prior to departure, have it approved by his/her major professor, and submit to the Agronomy main office in 2101 Agronomy Hall.

**Wireless Access Points**

Current wireless locations on campus are listed at the ISU Information Technology Office or the Solution Center in Room 195 Durham Center.

**COMPUTER LAB GUIDE**

**General Rules and Suggestions**

Food or drink is discouraged when using computers.

Please keep computer areas clean and orderly. Anything left lying around is subject to arbitrary removal or disposal.

Please maintain security. All rooms in Agronomy Hall are on an automatic climate control. Please report cooling/heating problems to your major professor rather than opening windows.

**Use of Computers**

There are several different clusters of computers available for graduate student use in the meteorology area. Computers in Rooms 3128 and 3008 are available for general use when classes are not in session.
During daytime undergraduates are given preference; however, they do not have access to these areas at night so after normal class hours these computers are available for graduate student use. Other computers are under the supervision of various faculty. Permission should be obtained before using these.