

# Meteorology Program Graduate Student Handbook 2019-2020



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## GENERAL INFORMATION

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This handbook is a guide to the graduate program in Meteorology within the Department of Geological and Atmospheric Sciences. 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.

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 <http://www.grad-college.iastate.edu/common/handbook/>.

Links to other ISU websites with resources for graduate students are:

Graduate College: <http://www.grad-college.iastate.edu/>

Office of the Registrar: <http://www.registrar.iastate.edu/>

Electronic Thesis/Dissertations at ISU: <http://www.grad-college.iastate.edu/current/thesis/>

Registration Information: <http://www.registrar.iastate.edu/students>

Academic Calendar: <http://www.registrar.iastate.edu/calendar/>

Graduate College Forms: <http://www.grad-college.iastate.edu/common/forms/index.php>

## ADMISSIONS REQUIREMENTS

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Requirements for full admission in Meteorology are as follows:

1. 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.
2. 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 6.5 IELTS (International English Language Testing System). Applications will not be processed until the department receives this score.
3. Statement of purpose describing research interests and future plans. This is part of and included in the online graduate application. Potential faculty mentors should be identified. Students will be admitted into the graduate program only if a faculty member agrees to serve as mentor.
4. The GRE (Graduate Records Examination) for the verbal, quantitative, and analytical areas are required for evaluation of the application, except for students who have earned or are earning their B.S. in Meteorology at Iowa State.

Enrollment of students into the MS or PhD programs is determined by Meteorology faculty.

Applicants with background deficiencies in the chosen areas of graduate study may be admitted with provisional status. 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). At a minimum, any student lacking prior coursework in the following subjects will be required to take courses in these areas during their first year at Iowa State University: calculus, ordinary differential equations, and calculus-based physics. Depending on when the graduate level Dynamic Meteorology and Atmospheric Physics courses are offered, students may also be required to take undergraduate level atmospheric physics,

and dynamic meteorology. The Meteorology faculty will evaluate grades earned in these courses, and decide if performance is sufficient for allowing the student to continue in the graduate program.

Students with a Bachelor's level degree are permitted to apply to either the MS or PhD program. Generally students entering the PhD program will have an MS degree from a university considered by the faculty to have an academically strong program. Otherwise most students will be enrolled in the MS program. Current MS students who wish to pursue a PhD must petition for formal enrollment in the PhD program. Students will petition by sending a brief memo (one or two sentences) to the DOGE and the student's major professor requesting PhD enrollment. For recent MS graduates, the petition must be submitted within three months after their MS advisor signs documents signifying successful completion of all MS degree requirements. For newly entering students, application for admission will be considered the petition. 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.

## **GRADUATE ENGLISH REQUIREMENTS**

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### **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.

### **Requirements for Non-Native English-Speaking Students**

Non-native English speakers must take the English Placement Test at the beginning of their first semester of enrollment at Iowa State. This test is required by the Graduate College and is administered by the Department of English. It must be taken in addition to the TOEFL (Test of English as a Foreign Language), which is taken as part of the admissions process, unless the TOEFL score is 640 or above (paper-based TOEFL), 270 or above (computer-based TOEFL), or 105 and above (internet-based), or the student scored 8.0 or above on the IELTS. Students who have received a bachelor's, master's or Ph.D. degree from an English-speaking university in the U.S.A., Canada, Great Britain, New Zealand, or Australia are also exempt. Students receiving low scores on these tests are assigned to appropriate sections of English 101. These courses should be completed in the student's first semester or within the first year of graduate study at the latest.

Additional information on the English Placement Test exam, exemptions, and contacts are available at <http://apling.public.iastate.edu/ept.html>.

Non-native English speakers who wish to teach at ISU must take the Oral English Certification Test (OECT) before beginning their teaching duties. Teaching opportunities depend upon the level of proficiency achieved on these tests. Students with low scores on OECT are required to enroll in the appropriate sections of University Studies/English 180 if their teaching responsibilities will involve interaction with undergraduates. Students from the English-speaking countries of Australia, Canada, New Zealand, Ireland, or the United Kingdom are exempted from the OECT. Students with sufficient IBT, TOEFL, and IELTS scores can also be exempted the OECT.

Additional information on the Oral English Certification Test, exemptions, and contacts are available at <http://acp.grad-college.iastate.edu/?q=node/15>.

### **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 meet a standard equal to that of a leading scientific journal. It is the responsibility of the student to ensure that drafts of the dissertation, thesis, or creative component have high quality; 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 on the Graduate College website.

## **ACADEMIC STANDARDS**

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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.

Before graduation is approved, 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.

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 <http://www.financialaid.iastate.edu/>.

## **FINANCIAL SUPPORT**

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### **Assistantships**

Teaching assistantships (TA) are available from the department on a competitive basis for students admitted on a full-time basis. Research assistantships (RA) are generally provided from the research grant of an individual faculty member. The number of assistantships available in the Meteorology Program will vary from year to year.

A TA will assist the instructor of the course for which they are assigned; duties may include 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 input from the faculty. For MS

students, TA support provided through the Meteorology program will be limited to four (4) semesters. The same rule will apply for students arriving at ISU to pursue a PhD. For students who first earn an MS at Iowa State and then decide to pursue the PhD., a total of six (6) semesters can be with TA support during the pursuit of both degrees. In all cases, extensions may be permitted if there are extenuating circumstances. After these time limits are met, any additional support from the program must be in the form of a RA support from the major professor.

An RA will conduct research under the guidance of their major professor. Research assistantships (RA) are offered to students qualified to assist faculty members holding sponsored research grants. An RA aids a faculty member in conducting research and is supported by the associated research grants of their major professor. The work required of the RA generally leads to thesis or dissertation research.

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 may be made at any time but will generally be made in early March. 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. While on assistantship, the student is required to maintain a 3.0 grade point average and take 9 credits in both the fall and spring semesters. Students on summer assistantships must register for at least 1 credit in the summer session.

The assistantship qualifies you as a C-base employee. Students on half-time assistantships are required to work at least 20 hours a week and students on a quarter-time assistantship are expected to work at least 10 hours a week on the tasks for which they are being paid. However, most students work far more hours on a weekly basis in order to complete his/her research and degree requirements.

Students holding an assistantship receive tuition support. A student on full admission with a 1/2-time assistantship receives a Graduate Tuition Scholarship for a portion of resident tuition. Students who are candidates for doctoral degrees receive a scholarship award that pays 100% of the in-state tuition costs. Master's candidates receive a 50% tuition scholarship award. These awards are reduced to 25% for MS students and 50% for PhD students on only 1/4-time assistantships. 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.

### **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. Coverage for hospital, accident expenses, surgical care, and maternity care are included. For more information, please consult the Graduate Student Handbook prepared by the Graduate College and or consult the Human Resource Services Department (benefits@iastate.edu). Graduate assistants are also eligible for up to six weeks of paid maternity or paternity leave, provided by the Graduate College and the College of Liberal Arts and Sciences. Maternity or paternity leave requires that the remainder of the semester be covered by either teaching or research assistantship to qualify for the paid six-week benefit.

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)**

PAGs are provided for ISU graduate students by the Graduate College and the Graduate Student Senate (GSS). Funds may be granted for attending a professional meeting, defined as a gathering of an organized society of professionals for the purpose of presenting research papers. PAGs may also be provided for attending professional workshops that provide "hands-on" experience not available at ISU. If at a professional meeting the student is presenting results of research generated at ISU, the travel grant may be up to \$200.

Each graduate student is eligible to receive one PAG per fiscal year (July 1 through June 30). Each request must be approved by the major professor, Department Chair, and academic dean. Applications should be submitted as early in the Fall and Spring semesters as possible as funds are usually depleted by November 15 for the Fall funding period and April 1 for the Spring funding period. The forms are found at <http://www.grad-college.iastate.edu/gpss/PAG/index.html>.

### **PROGRAM OF STUDY (POS) AND PROGRAM OF STUDY COMMITTEE (POSC)**

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A Program Of Study Committee (POSC) provides programmatic oversight for the graduate student and suggests courses necessary for a student's area of specialization. The POSC ensures departmental and university requirements are met. Students are encouraged by the Graduate College to establish a POSC as soon as the major professor is selected. The student should form the POSC as soon as possible but the student must form the POS Committee by the **end of the second semester of graduate study**. See Appendices A and B for flowcharts of procedures for earning M.S. and Ph.D. degrees, respectively.

The Program of Study (POS) outlines the planned coursework and timeline of the student during their graduate program. The student and the major professor develop the program of study (POS) with the consultation and approval of the POSC. The POS will be designed to correct deficiencies in academic preparation, allow study of subject matter that most interests the student, and avoid repetition in areas where the student is well prepared.

The POSC and POS are established by submitting the online POSC form through AccessPlus. Committee members and the Director of Graduate Education (DOGE) for the Meteorology graduate major will be notified by email that they have a POSC to approve. Once approved by everyone, it will then be submitted to the Graduate College for final approval. When the Graduate College has approved the POSC, it will be available in AccessPlus. You, your major professor and the department graduate contact will have access to your records. Any changes to an approved POSC can be done online.

The POSC form should be submitted as soon as possible but must be approved by the Graduate College **no later than the term before the preliminary oral examination (doctoral candidates) or final oral examination (master's candidates)**. In order for the POS form to be approved in any given term, the form must be submitted to the Graduate College by the published deadline for that term.

Changes in an approved POS can be processed through the Graduate College with the agreement of the student, major professor, and the DOGE 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 approval 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 POSC has at least three members.
- The POSC must include two “inside” committee members from the Meteorology faculty, and one “outside” member from a different field of emphasis. Meteorology faculty are always considered inside members. Affiliated Meteorology faculty can be considered an inside or outside member depending upon the student’s research topic. Affiliated Meteorology faculty can serve as the primary adviser for a Meteorology graduate student, in which case the faculty member is considered an inside member of the POSC. Meteorology and Affiliated Meteorology faculty are listed on pages 16-18.
- All committee members must belong to the graduate faculty of the university.
- If a minor is being pursued by the student, a member of the advisory committee associated with the minor (see ISU General Catalog) must also be on the POS Committee.
- If a co-major is being pursued, two members of the Meteorology faculty must be on the POS committee.

### **PhD Degree**

- The POSC has at least five members.
- The POSC must include at least three “inside” committee members from the Meteorology faculty, and at least one “outside” member from a different field of emphasis. The fourth POSC member may be either an inside or outside member. Meteorology faculty are always considered inside members. Affiliated Meteorology faculty can be considered an inside or outside member depending upon the student’s research topic. Affiliated Meteorology faculty can serve as the primary adviser for a Meteorology graduate student, in which case the faculty member is considered an inside member of the POSC. Meteorology and Affiliated Meteorology faculty are listed on pages 16-18.
- All members of the POS Committee, including the major professor, must be members of the graduate faculty.
- If a minor is being pursued, a member of the advisory committee associated with the minor (see ISU General Catalog) must also be on the POS Committee.
- If a co-major between Meteorology and any other discipline is being pursued, three POS committee members must be from the Meteorology faculty of the Department of Geological and Atmospheric Sciences if Meteorology is listed as the first major; otherwise two POS committee members must be from the Meteorology faculty. In both cases, one of these Meteorology faculty members should be co-major advisor.

## **DEGREE REQUIREMENTS IN METEOROLOGY**

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### **Students Needing Remedial Coursework**

Graduate students admitted with provisional status due to coursework deficiencies will be required to take remedial classes during their first year at Iowa State University in order to gain the background needed to

successfully complete the graduate-level meteorology curriculum. During the admissions process, the Meteorology faculty will evaluate each student's prior coursework and outline a series of courses that the student must satisfactorily complete in order to gain full admission status. Minimum undergraduate coursework required are: calculus, ordinary differential equations, and calculus-based physics. Calculus and physics courses must be taken prior to enrollment in graduate level meteorology courses; differential equations can be taken concurrently with graduate level meteorology courses. If students have not had prior courses covering atmospheric physics and dynamic meteorology, they may be required to take some of the undergraduate courses in these areas if these courses are offered in a semester prior to the offering of the graduate level versions. Otherwise, students will be directed to study from the books used in the undergraduate courses prior to their arrival so that they will be better prepared for success in the graduate level courses (See Admissions Requirements.) The student must earn B or better (not B-) in all remedial courses required by the Meteorology faculty. A grade below B (B- or lower) in any remedial course may lead to dismissal from graduate enrollment.

Prior to the student's first semester of enrollment, the student is encouraged to provide samples of previous work (undergraduate thesis, term papers, problem solutions, research summaries, work experience, internships, and other evidence of academic and practical experience) as supporting evidence of competency in the areas of identified deficiencies. If evidence exists that the student has the appropriate experience in a particular area of deficiency, the Meteorology faculty may approve adjustments to the recommended remedial coursework.

Up to 15 credits of combined 300- and 400-level undergraduate coursework can be included on the student's POS, given the restrictions set forth by the Graduate College. Specifically, the POS cannot include courses from any department numbered 200 and below or courses within the student's major numbered 300 and below.

### **MS Program**

The Meteorology Program of the Department of Geological and Atmospheric Sciences offers MS degrees in Meteorology, and acts as a home department for the interdepartmental M.S. degree in Environmental Sciences. The faculty work with students to assure that their Programs of Study will have appropriate breadth while permitting suitable specialization.

### **MS Coursework**

All MS student are expected to complete MTEOR 542 (Physical Meteorology) and MTEOR 543 (Advanced Dynamic Meteorology I). In addition, students should take at least 4 courses from the list of graduate Meteorology electives (502, 504, 505, 507, 516, 518, 540, 552, 568, 589, or 605) or from outside the department according to the students' professional goals and interests. Students without prior synoptic meteorology course work must complete MTEOR 511 and may substitute these credits in place of other elective courses. Typically MS students will take 18-21 credits of formal coursework and can take additional elective courses beyond the 6 courses required. Students must work closely with their major professor and POS committee to choose the required course work.

### **MS Thesis**

Candidates for the M.S. degree in Meteorology complete a thesis based on the candidate's original research. Candidates for M.S. degrees with a non-thesis option must prepare a scholarly paper (a "creative component") based on the individual's work as outlined with their major professor. The MS degree with the creative component is a terminal degree in the Meteorology Program of Iowa State University.

The thesis or creative component should present 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.]

### **MS Defense**

The candidate must defend the thesis or creative component before the Program of Study Committee and other faculty members who desire to attend. The date, time, and place of the defense must be publicly announced. A request for Final oral Exam form must be submitted to the Graduate College at least 3 weeks in advance of your defense date. The Final Oral Exam form is completed and processed online through the Graduate College webpage. Copies of the thesis or creative component must be given to committee members at least two weeks in advance. Following the public seminar, there will be a period called the defense in which the degree candidate will be examined in more detail by the members of the POS committee. The major professor presides at the defense and gives all interested faculty members the opportunity to question the candidate. After a thesis defense, the Program of Study Committee determines whether the thesis represents the results of original research, is a worthy contribution to the field, and has been adequately defended. Affirmation of these three conditions constitutes acceptance of the candidate's thesis. In a similar way, the Program of Study Committee determines whether a creative component is the candidate's individual accomplishment, is a worthy contribution to the field, and has been adequately defended. A creative component is acceptable if it meets those criteria.

The requirements outlined above have been designed to permit completion in approximately four semesters. The Department discourages programs requiring a longer time span, as financial support for M.S. degrees is no longer than five semesters.

Students are responsible for seeing that the requirements for a graduate degree are satisfied and that they have met the appropriate deadlines for filing forms with the Department or the Graduate College. Students should read the Graduate College Handbook (<http://www.grad-college.iastate.edu/common/handbook/>) and be aware of the Graduate College's guidelines for theses and dissertations (<http://www.grad-college.iastate.edu/current/thesis/>).

### **PhD Program**

The Ph.D. degree program emphasizes independent scholarly research; it prepares a graduate for leadership in the scientific community. A creative and productive scholar must have a good comprehension of basic principles, a capacity for critical and independent thought, and strong intellectual curiosity. In the evolution of a scholar, there is a transition from the stage where the primary concern is that of building a foundation to that in which the primary concern is extending knowledge through original research. The transition is a function of intellectual development and is different for each individual. The transition occurs when an individual has mastered sufficient knowledge to allow critical evaluation of material in the field of study. The extent to which an individual develops and exercises intellectual curiosity determines the ultimate success of that individual as a scholar.

Graduate study for the Ph.D. degree is intended to develop scholars. In the early stages of the program, a firm comprehension of basic principles should be of primary concern. As graduate study progresses, the student should develop a disciplined skeptical mind and a strong intellectual curiosity. These skills should be honed

during the latter stages of graduate study by the development of a dissertation that will be a significant contribution to the field chosen.

Students who are granted admission to the Ph.D. program in the Meteorology Program normally hold a master's degree from an institution considered by the faculty to have an academically strong program (also see Admissions Requirements). However, students without a master's degree but with particularly strong qualifications, as assessed by the Meteorology faculty, can be admitted directly to the Ph.D. program. Students who enroll as candidates for the M.S. degree, with no break in residence, can petition the Department for waiver of the M.S. degree. Such a petition may not be made until the student has successfully completed 18 credits of graduate-level course work, and can be no later than the end of the third semester of residence. The petition involves a statement (approximately 1 page in length) concerning the reasons why an M.S. degree should be waived and the nature of the proposed project. Waiver of the M.S. requires approval by the departmental faculty.

The Ph.D. program has two stages: pre-candidacy and candidacy. The pre-candidacy stage is largely a program of course work designed to broaden and strengthen the student's fundamental knowledge, particularly in areas related to the dissertation topic. The candidacy stage consists mainly of research for the dissertation.

### **Pre-candidacy stage**

#### 1. Residence Requirements

A student must be in continuous residence at the university during the pre-candidacy stage, except for interruptions such as the summer months or at other periods approved by the POS Committee. Part-time residence or transfer of credits from another university requires approval of the departmental Graduate Application Evaluation Committee.

#### 2. PhD Preliminary Examination.

The preliminary exam provides an evaluation of the student's capacity for doing Ph.D. work and working knowledge of his or her subject area. In addition, the exam serves to diagnose areas in which the student requires additional learning. The overall goal of the exam is to demonstrate the student's readiness to engage in independent research through both oral and written evidence.

The Preliminary Exam for Ph.D. students must be taken the semester after they complete their POSC and POS, **and within 18 months of enrolling**. Under special circumstances that impede student progress, the student may delay taking Preliminary Exam by one semester. To request a delay, the student must submit a written petition to the student's major professor for approval.

The Preliminary Exam includes written and oral components (described below) and is administered by the POSC. The written report must be provided to the POSC at least 2 weeks prior to the oral component of the examination. The **Request for Preliminary Oral Exam** form must also be submitted to the Graduate College at least **2 weeks prior** to the date of the oral component of the examination. The Request for Preliminary Oral Exam form is completed and processed online through the Graduate College webpage. The oral presentation of the preliminary exam can be made open to the public if the student so chooses.

The faculty believe that each graduate student in meteorology at Iowa State must master the following fundamental concepts.

1. Science is the systematic search for patterns to describe, predict, and understand the natural world.

2. Science is not useful unless it is communicated effectively. Scientists should be able to communicate the significance of their research, including its broader impacts, to other scientists and to the larger community. This includes capability to communicate at the standards established for professional journals and conferences.
3. The laws of conservation of mass, momentum and energy form a powerful conceptual framework through which one can deduce the behavior of the atmosphere and its interactions with the rest of the climate system.
4. The flow of water, in particular, through the atmosphere and land shapes their coupled behavior. This behavior, coupled with water's pervasive role in biogeochemical processes, means that the water cycle has a strong, central role in how humans are engaged in the global Earth system.
5. The atmosphere has multi-scale behavior. Scaling relationships allow one to extract simplified perspectives and important knowledge about atmospheric behavior.
6. Models are useful when they can be used to make predictions or integrate the knowledge necessary to understand a complex system. Models should be as simple as possible. Models have their strongest physical underpinnings when based on conservation laws.
7. Different types of models are useful in different situations. Good science determines appropriate use of a model. Empirical models only strictly apply to the specific environment in which they were formulated. Process-based models can theoretically apply to multiple environments by adjusting the parameters of the model, but these parameters may be difficult (or impossible) to measure directly.

The student will produce a written report (written component of the preliminary exam) that clearly demonstrates a strong foundation in the fundamental concepts for a meteorology graduate education. The student is encouraged to work closely with their major professor to integrate this report with the student's proposed thesis research. The written report should include research completed by the student, done in consultation with the student's major professor. The research can be a short project, roughly 1-3 months in length, that will not necessarily become a part of a later dissertation, or it could be initial research toward the dissertation. The project should be an opportunity for the student to start showing independence in research, but not necessarily be a completed project. It may form part of a chapter in a Ph.D. thesis.

The written report may use part of an M.S. thesis completed by the student, but it must be a demonstration of the student's independence in research. Typically, the M.S. thesis shows the ability to perform research, but under the close guidance of a professor. Thus, a student wishing to use a portion of an M.S. thesis for the report will have to show how that demonstrates the student's research independence and creativity. The student should discuss with the major professor if this is a suitable option.

As part of the written report, the student should present evidence for student learning under each of the fundamental concepts listed above. The evidence should demonstrate in this context a synthesis of knowledge gained and not be simply a checklist of loosely related items. The research presented should provide some of the evidence. The student is also encouraged to critically examine the current list of fundamental concepts. The student is encouraged to advocate for modification or maintenance of this list.

The oral exam has two parts, a presentation and a question/answer period. The student will make an oral presentation to the POSC and others that the student may invite that summarizes and defends the written report. Following the oral presentation the student will address questions posed by the POSC on the student's work and general knowledge base in a closed oral exam format. If the written report derives from the

student's M.S. thesis, the student should note that the intent of the oral presentation differs from the M.S. seminar. The M.S. seminar shows that the student has completed a body of work under the guidance of a professor and can present it competently. The Preliminary Exam's oral presentation should emphasize instead the student's original contributions to that research as part of demonstrating the capability to perform independent, creative research.

After the oral presentation and exam, the POSC will evaluate the student's body of work, with the preliminary exam a central focus. The evaluation will also include other previous, relevant work, such as coursework while a graduate student at ISU and other products such as publications and presentations, if any. It may include coursework and other relevant research products prior to graduate work at ISU.

The POSC will determine whether or not the student satisfies standards expected of someone who will conduct and complete Ph.D.-level research. The evaluation will include diagnosis of areas needing improvement. The POSC will make one of the following recommendations:

- Pass: Indicates the student has sufficient working knowledge of this area to advance to the research component. The student will then be admitted to the Ph.D. candidacy stage.
- Conditional 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 will be specified by the POSC and must be completed by the student within the timeframe determined by the POSC.
- Not Pass with option to retake the examination: In the case of a negative evaluation, the POSC will also recommend whether or not the student should attempt the exam again. In the event that the student is allowed to retake the exam a second time, the student must wait at least 6 months before attempting the exam again. The POSC will set a deadline by which the exam must be retaken. In the event of a second negative evaluation, the student will be required to terminate his or her PhD program.
- Not Pass without option to retake the examination: In the case of a negative evaluation where the POSC does not recommend a second attempt, the student must terminate his or her PhD program.

The Graduate College requires that all active Ph.D. students have an annual review of their progress. The Ph.D. student will meet annually with the major professor to review the following: 1. Milestones or accomplishments reached (this should include academic performance, research activities, publications, presentations, professional improvement activities, institutional or professional service, or other); 2. Challenges (this should include any obstacles that have presented or hindered your ability to achieve your goals for the year); and 3. Discussion of goals for the coming year. Unsatisfactory progress during the previous year may result in assistantship support not being given in the following year.

## **Candidacy stage**

### 1. Admission to Candidacy in the PhD program

Passing of the Preliminary Examination, plus completion of the university requirements, constitutes admission to candidacy for the Ph.D. degree.

### 2. Residence and PhD Course Requirements

The total course credit requirement for the Ph.D. is 72 semester credit hours. Credits earned for the M.S. degree may be applied if approved by the POS Committee, with the restriction that no more than 36 semester

credits, and no research credits, may be included in the Ph.D. program of study. At least 36 semester credits, including all dissertation research credits, must be earned in residence at the university. A minimum of 18 semester credits of dissertation research must be applied to the 72 credits required for completion of a Ph.D. degree program.

Course requirements for the PhD degree include at least 12 credits of structured coursework beyond the courses required for the MS degree (see MS Program). At least 3 of these credits must be taken in a course outside meteorology. Some or all of the core 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. For courses taken elsewhere, the Graduate College requires that grades be B or higher for them to be permitted to be used on the POS form, and courses with R grades cannot be transferred.

### 3. Prospectus

Upon passing the PhD preliminary 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. The prospectus must be sent to all POS committee members two weeks prior to the date of this oral presentation.

The prospectus meeting involves only the POSC. No Graduate College forms are needed for the prospectus.

### 4. PhD Dissertation

A doctoral dissertation must be completed on a topic in the major field of study and written in a form that is suitable for publication in major journals in the field. To be acceptable, it must constitute a significant contribution to knowledge within the field of study and be approved by the student's POS Committee. Copies of the completed dissertation must be in the hands of the POS Committee two weeks prior to the date of the final oral examination.

The Graduate College needs the approval of the committee and program before it can review the final copy of the dissertation. Note that the *formatting* of the thesis must follow guidelines set by the Graduate College A "Thesis/Dissertation Submission Request" form available from the Graduate College's Web site at <http://www.grad-college.iastate.edu/common/forms/index.php> must be completed and mailed, emailed with an attachment, faxed, or hand carried to the Graduate College office in 1137 Pearson Hall by the deadline published each term. After the form is received, the student is given approval to sign on to ProQuest's Web site and submit their dissertation electronically for review and final deposition. One printed copy of the dissertation needs to be provided to the Department. A copy of the dissertation should be provided for each of the committee members if so requested.

### 5. PhD Final Examination

A final oral examination will be taken after all work described for the degree is completed and the dissertation is reviewed by the POS Committee. A request for Final oral Exam form must be submitted to the Graduate



College at least 3 weeks in advance of your defense date. The Final Oral Exam form is completed and processed online through the Graduate College webpage. The final oral examination will be administered by the POS Committee with the major professor serving as chairman. The examination is intended to be a defense of the dissertation. The first part of this examination will be a public seminar on the dissertation. The date, time, and place of the defense must be publicly announced. 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.

#### 6. Revocation of Candidacy for PhD

A candidate who has not completed a dissertation within four years after admission to candidacy must submit a written petition to the Departmental Chair for renewal of candidacy. The petition will be presented by the Chair to the full faculty for review. Otherwise, candidacy will be revoked, and the student must terminate work toward the Ph.D. If there is insufficient evidence of progress, the petition may be denied, and the student will be advised to discontinue work.

#### Seminar Requirement for all graduate students

In addition to the requirements outlined above, all graduate students are required to enroll in Mteor 595B (R cr.) in both the fall and spring semesters. Speakers in the departmental seminar series are lecturers invited from outside of the Department across the full spectrum of the geosciences and are intended to appeal to the diverse interests of all members of the department. All graduate students are expected to attend seminars; lack of attendance will result in a failing grade for the semester. Students are also expected to participate in special Meteorology seminars.

### **GRADUATE COURSES IN METEOROLOGY**

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**Mteor 502. Watershed Hydrology.** (Dual-listed with 402). (Cross-listed with ENSCI, GEOL, NREM). (2-3) Cr. 4. F. *Prereq:* Four courses in physical or biological sciences or engineering; junior standing. Examination of watersheds as systems, emphasizing the surface components of the hydrologic cycle. Combines qualitative understanding of hydrological processes and uncertainty with quantitative representation. Laboratory emphasizes field investigation and measurement of watershed processes.

**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 2021. *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.

**Mteor 507. Mesoscale Meteorology.** (Dual-listed with 407). (Cross-listed with Agron). (3-0) Cr. 3. Alt. S., offered 2020. *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 516 Hydrologic Modeling and Analysis.** (Dual-listed with 416x). (2-3) Cr. 3. Alt. S., offered 2021. 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 518. Microwave Remote Sensing.** (Cross-listed with Agron, E E). (3-0) Cr. 3. S. Alt. S., offered 2020. *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 540X. Tropical Meteorology.** (Dual-listed with MTEOR 440X). (3-0) Cr. 3. Alt. F (offered in 2019). *Prereq: Credit or enrollment in MTEOR 341.* Weather and climate of the tropical atmosphere. Weekly forecast discussions related to the development of tropical cyclones and teleconnection patterns between the tropics and higher latitudes. Topics covered include easterly waves, tropical cyclogenesis (i.e., hurricanes, typhoons, cyclones), equatorial waves, El Niño-Southern oscillation, Madden-Julian oscillation, and monsoons.

**Mteor 542. Physical Meteorology.** (3-0) Cr. 3. Alt. F., offered 2019. *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 2020. *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. Climate Modeling.** (Dual-listed with MTEOR 452). (3-0) Cr. 3. Alt. F., offered odd-numbered years. *Prereq: Mteor 301.* Developing and working with climate models based on 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 568: Applied Geostatistics for Geoscientists** (Dual-listed with MTEOR 468). (3-0). F. *Prereq: Geol 452, CRP 351, CRP 452, NREM 345, or NREM 446.* Introduction to geospatial data collection, analysis, interpretation, and presentation. Geospatial techniques including geographic information systems (GIS), remote sensing (RS), and global positioning systems (GPS). Study of applied geostatistical analysis (e.g., interpolation and spatial regression).

Mteor 589: Survey of Remote Sensing Technologies. (Dual-listed with 489). (3-0) Cr. 3. F. *Prereq: Four courses in physical or biological sciences or engineering.* Electromagnetic-radiation principles, active and passive sensors, multispectral and hyperspectral sensors, imaging radar, SAR, thermal imaging, lidar. Examples of applications. Also offered online S.

**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
- M. Hydrology
- N. Geophysical Fluid Dynamics

**MTEOR 595B. Graduate Seminar.** (Cross-listed with GEOL). Cr. 1. Repeatable. F.S. *Prereq: Senior or graduate classification.* Weekly seminar on topics of current research interest. All students seeking a graduate degree in geology or meteorology must enroll during each semester of residence. Students pursuing a non-thesis option for the M.S. in Earth Science must enroll for one semester. Offered on a satisfactory-fail basis only.

**Mteor 605. Boundary-Layer Meteorology.** (3-0) Cr. 3. Alt. F., offered even-numbered years. *Prereq: MTEOR 443 or equivalent-level course in engineering fluid.* Atmospheric boundary-layer structure and dynamics. Diurnal and seasonal variations, turbulent fluxes and turbulence kinetic energy. Measurements and empirical relations for wind and temperature near the ground. Numerical simulation and applications to wind energy.

**Mteor 699. Research.** Cr. arr. Repeatable. Ask the Meteorology Program Assistant for registration information: MaryAnn Grapp (magrapp@iastate.edu).

## **MINOR/CO-MAJOR IN METEOROLOGY**

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The department offers a minor in Meteorology which may be earned by completing a total of 15 credits of course work, 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.

The department also offers co-major between Meteorology and other disciplines for both MS and PhD degrees. The basic requirements for both degrees follow the requirements of the Meteorology major. Meteorology courses beyond those required must be chosen in consultation with the POS committee.

## **FACULTY RESEARCH INTERESTS**

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Prospective graduate students are strongly encouraged to contact faculty with similar research interests prior to submitting an application and/or while his/her application is under review.

### **Meteorology Faculty**

#### **Kristie J. Franz**

The primary goal of Dr. Franz's research is to advance the methodology used for predicting hydrologic processes on short to long time horizons through improved understanding and representation of hydrologic variability and uncertainty. In particular the research explores the use of new data technology such as satellite-based observations, forecasting methods such as ensemble prediction, and modeling methodologies such as distributed and coupled surface/subsurface modeling to improve streamflow modeling and forecasting. Other interests include forecast verification, climate change impacts on hydrology, model calibration, and understanding human impacts in watershed systems.

#### **William A. Gallus, Jr.**

The research of Dr. Gallus primarily focuses on improving weather forecasting through both improvements in numerical modeling techniques and understanding of mesoscale weather systems. In particular, the research emphasizes improved prediction of warm-season convective systems, both their convective mode and their rainfall, through ensemble techniques, improved initialization of mesoscale features, modification of parameterizations, better understanding of land-surface interaction with the lower troposphere, and use of post-processing. Additional research interests include prediction of wind for wind energy needs, severe weather, and improvements in geoscience education.

#### **Alex Gonzalez**

Dr. Gonzalez's research focuses on tropical atmospheric dynamics and quantifying transient features of tropical phenomena with a particular interest in systems that span the gap between weather and climate time scales. His work is centered around generalizing traditional theories to include finer spatial and temporal scale features using a hierarchy of models, from linear mathematical models to state-of-the-art climate models. Reanalysis and observational data sets are often investigated in concert with models. Main topics of study include the Madden-Julian Oscillation (MJO), tropical cyclogenesis, the Inter-Tropical Convergence Zone (ITCZ), the Hadley circulation, and equatorial waves.

#### **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 and Arctic climates and he has had significant collaboration with scientists in these regions. As part of his research, Dr. Gutowski is a Co-Chair of the Coordinated Regional Downscaling Experiment (CORDEX), a project of the World Climate Research Programme.

### **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.

### **Affiliated Meteorology Faculty**

### **Brian Hornbuckle**

How are agricultural ecosystems affected by weather and climate? How are weather and climate affected by agricultural ecosystems? Dr. Hornbuckle's research group is working to help answer these questions by investigating land-atmosphere interactions, the exchange of mass and energy between Earth's terrestrial surface and its atmosphere. We have expertise in the use of remote sensing to monitor the water content of soil and vegetation. We use both passive microwave sensors on NASA and European Space Agency satellites, as well as ground-based cosmic-ray neutron detectors. We also work to improve the modeling of how soil and vegetation influence land-atmosphere interactions.

### **Andy VanLoocke**

The primary goal my research program is to develop and refine estimates of the impacts of ongoing and future land use change and global change on agro-ecosystem processes and services. Projects are currently under development that will apply a combination of field-based measurements with agro-ecosystem models to assess 1) the water use and water use efficiency of sorghum, a potential bioenergy feedstock 2) the implications of introducing novel, highly productive lines of Switchgrass on agro-ecosystem services 3) interactions of large-scale wind energy operations with surrounding agricultural fields 4) the impacts of global change (increasing drought frequency, atmospheric CO<sub>2</sub> and temperature) on the productivity and biogeochemistry of the corn-soybean agro-ecosystem.

### **Yuyu Zhou**

Dr. Zhou's research interests lie in the applications of geospatial technologies including remote sensing, GIS, geovisualization, spatial analytic tools, and integrated assessment modeling to understanding the problems of global environmental change (e.g., urbanization, urban heat island, ecosystem phenology, energy supply and demand, and greenhouse gas emissions) and their potential solutions. His research focuses on quantifying spatiotemporal patterns of environmental change and developing modeling mechanisms to bridge the driving

forces (both natural and socioeconomic factors) and consequences of environmental change so that the impacts of human activities on environment can be effectively measured, modeled, and evaluated.

## **GENERAL GUIDANCE FOR NEW AND CURRENT STUDENTS**

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### **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 University ID or Social Security Number, 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.

### **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. There is also a fee for students requiring replacement of lost ISUCards. More information regarding fees can be found at the ISU Card Office website <http://www.isucard.iastate.edu/>.

### **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. You must have an ISU ID card to register. Information about registering for a Net-ID can be found at [https://www.it.iastate.edu/howtos/register\\_net-id](https://www.it.iastate.edu/howtos/register_net-id). Note that 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". If a student withdraws or graduates, his/her e-mail account remains active until the 18<sup>th</sup> 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.

### **Registration**

Graduate students should register on AccessPLUS as soon as the time period opens for them. 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. You should receive a letter describing the process of registering for AccessPlus.

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 Registrar's websites. Registration for summer session should be completed during the spring, at the same time as registration for fall semester.

A reference number is required for all courses. General course numbers are listed on the Registrar's website. Reference numbers for research and special topics courses can be obtained from MaryAnn Grapp in 2101 Agronomy Hall ([magrapp@iastate.edu](mailto:magrapp@iastate.edu)).

### **Add and Drop Procedures**

Students can use Web Registration to process drops until the fifth day of classes. After the fifth day of classes, a Request for Schedule Change or Restriction Waiver (Add/Drop Slip) form is needed for any changes to the class schedule. A class is not automatically dropped if a student does not attend lectures or laboratories. Add/Drop Slips require the signatures of the major professor, instructor, and the Department Chair/Graduate Dean.

A pass/no pass grading option is also offered. The Add/Drop Slip is used to designate this option. The pass/no pass option requires the signature of only the major professor.

Students are responsible for knowing the deadlines for registration and schedule changes, including cancelling and withdrawing from classes. The Meteorology Graduate Program Assistant (currently MaryAnn Grapp) in 2101 Agronomy Hall has a supply of add/drop slips. There are also forms available on the desk in Agronomy Hall 3010.

### **Forms**

Many of the forms graduate students will need during their tenure at Iowa State are available from the Graduate College website as listed at the end of this document.

### **Mail Boxes**

You will have a mailbox in room 2104P, which is the mailroom in the Agronomy Administration Office suite, 2104 Agronomy Hall. This is where you will receive important notices about department activities and programmatic matters. Each major professor has a mailbox called Support Mailbox which is located directly under his/her mailbox. Each is identified in alphabetical order. 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 and Keys**

New students are assigned a desk by the Meteorology Professor-in-Charge. Check in with MaryAnn Grapp, Meteorology Graduate Program Assistant in 2101 Agronomy Hall when you first arrive. She will assist you in completing a Directory Information form that will include your office room number and the keys you will require. Within a few days, you will receive a Key form in your Support mailbox to take to the Key Desk in General Services Building where you will need to sign it in their presence and pick up your key(s). Make sure to take your University ID card with you for identification. Keys usually are ready for pick up after 12 noon 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 \$25 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.

### **Research-Related Photocopies**

Students on research assistantships should obtain a photocopy account code from their major professor for photocopy use in the Parks Library.



### **Racial/Ethnic and Sexual Harassment Policy**

The Department of Geological and Atmospheric Sciences emphasizes and reaffirms its commitment to maintaining a working and learning environment free from racial/ethnic and sexual harassment. Anyone who believes that she or he has been subject to racial, ethnic, or 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 Affirmative Action Office. Students may obtain information about the University's harassment policy and resolution procedures in several offices (Dean of Student's Office, Student Counseling Services, and the Sloss Women's Center). The university policies on discrimination and harassment can be found at <http://policy.iastate.edu/policy/discrimination/>. Resources for students who may be victims of sexual misconduct can be found at <http://www.dso.iastate.edu/sexualmisconduct/>.

The Department requires all admitted graduate students to take a web-based Racial/Ethnic and Sexual Harassment Training, available through the AccessPlus System. To start, login to AccessPlus, click on the Employee tab, click on Web-based Training, and click on an appropriate training tab (Racial/Ethnic Harassment Prevention or Sexual Harassment Prevention). Follow training instructions.

### **Student Accident Reporting**

ISU's Thielen 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 Lisa McEnaney, Room 2104 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 (including summer session) must fill out a LAS Travel/Absence Approval Form (travel authorization) prior to departure, have it approved by his/her major professor, and submit to the main GEAT office clerical person in 253 Science I (currently Joan Dodd). That person, or the Meteorology Graduate Program Assistant in 2101 Agronomy, can give you the form or send it to you electronically.

### **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.

### **F-1 and J-1 Credit Requirements**

Information for international students can be found on the International Students and Scholars website. [https://www.isso.iastate.edu/joomla/index.php?option=com\\_content&view=category&id=30&Itemid=231](https://www.isso.iastate.edu/joomla/index.php?option=com_content&view=category&id=30&Itemid=231).

## **COMPUTER LAB USE**

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Although most graduate students will be given their own computer in their office, there also 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. Undergraduates are given preference; however since they usually do not have their own office space. Other computers are under the supervision of various faculty. Permission should be obtained before using these. Remember that computers provided to you are the property of Iowa State and therefore cannot be used for gaming, watching of movies, or other non-work-related purposes.

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.

## **STUDENT OFFICE USE**

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Graduate students are assigned a desk in one of a number of graduate student offices depending on availability. This is a shared space and students are expected to be considerate of the other students sharing the office. A student is expected to keep his or her area tidy and to engage in any other activities that help maintain a good working environment for everyone. Avoid the accumulation of trash by disposing of it regularly, particularly food items. It is not appropriate to use someone else's desk, computer, or other equipment without asking for permission from that person or their major professor. For sanitary reasons, the use of tobacco products in student offices and departmental space, including chewing tobacco, is prohibited. To maintain a productive

and respectful work environment, speakers cannot be used to play music, video or conference call unless there is no one else in the room. Otherwise, students must use headphones.

The privilege of using graduate student space comes with the responsibility of helping to create a comfortable office environment and minimizing any behavior that may impinge on the ability of another student to conduct his or her work. If you have concerns about your office, please talk to the Professor in Charge or your major professor.

## FORMS

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All Graduate College forms can be found at [https://www.grad-college.iastate.edu/common/forms/student\\_forms.php](https://www.grad-college.iastate.edu/common/forms/student_forms.php).

Links to other university forms and information are available at <http://www.ats.iastate.edu/forms.html> as categorized below:

**Accounting and Payroll**. Contact: Controller's Office, 515-294-6653

**Financial Aid**. Contact: Office of Student Financial Aid, 515-294-2223

**Graduate Students**. Contact: Graduate College, 515-294-4531

**Human Resources**

**Housing**. Contact: Department of Residence, 515-294-2900

**International Students and Scholars**. Contact: International Students and Scholars Office, 515-294-0373

**Recreation Facilities**. Contact: Recreation Services, 515-294-4980

**Registrar**. Contact: Office of the Registrar, 515-294-1840