



NORTHERN ILLINOIS UNIVERSITY

## College of Liberal Arts and Sciences

*Department of Geography*

### **Cuguo gpvRcp/'Meteorology B.S.**

#### **Program Objectives**

The baccalaureate degree program in meteorology provides an atmospheric science focus for students pursuing a liberal education at Northern Illinois University. The program is designed about two primary objectives: 1) to provide students with a fundamental background in atmospheric science and related earth and environmental sciences; and 2) to provide students with a range of elective course work that qualifies them for designation as a "meteorologist" in a variety of career fields—from weather forecasting to broadcast meteorology.

#### ***Subject Matter Objectives***

The objectives of the B.S. program in meteorology focus on the following goals of basic understanding and pre-professional development:

1. understand basic characteristics of the atmosphere, its structure, and its dynamics;
2. understand the role of the earth's surface and oceans in forcing and regulating atmospheric processes;
3. be able to synthesize information from maps and other sources to identify current atmospheric processes, explain weather conditions, and hypothesize near-term expected conditions;
4. be able to communicate an understanding of weather and climate orally and graphically;
5. be able to formulate research questions in terms of atmospheric and climatic processes, identify appropriate source material, and provide an interpretation of analytic results;
6. be qualified for entry-level career fields in meteorology and/or admission into graduate programs in atmospheric science, geography, or applied climatology.

#### ***Skills Objectives***

1. To enable students to develop their understanding of atmospheric processes through an examination of processes operating within the real world.
2. To develop students' awareness of the connections of meteorology within the environmental sciences and/or the social sciences, and to demonstrate meteorology's importance within these endeavors.
3. To develop students' skills in the acquisition of information through desk, laboratory and field inquiry.
4. To further develop students' skills in the handling and analysis of meteorological material by a variety of methods including quantitative, computer, and laboratory analysis.
5. To further develop students' skills in the presentation of information and of the results of analysis through written and oral communication.
6. Further to enhance students' skills in the handling of information technology.
7. To introduce students to new skills involved in meteorological research.
8. To train students in the execution of meteorological research projects.

## Assessment Rubric

Table 4: Subject Matter Objectives Assessment

Subject Matter Objective	External standards	Student standardized performance	Internship	Honors/capstone project	Focus groups	Employer survey	Graduate survey
1. understand structure & dynamics of the atmosphere	1, 2	4, 5	6	6, 7	8	9	10
2. understand regulating role of earth's surface	1, 2	4, 5			8	9	
3. synthesize weather information from maps	1,2	4, 5	6	6, 7			
4. communicate orally & graphically		4, 5	6,7	6,7	8	9	10
5. formulate & conduct research			6	6, 7			10
6. qualify for entry-level positions in meteorology	1, 2, 3, 11				8	9	10

Table 5: Skills Objectives Assessment

Skill Objective	Student standardized performance	Reference standards	Standardized course evaluation	Internship	Honors/capstone project	Focus groups	Employer survey	Graduate survey
1. observe real-world processes	1, 2, 5	11, 12	14	6, 7	7			
2. connect with social & environmental sciences	5	13				8	9	10
3. acquire information			14	6, 7	7			
4. analyze meteorological data	1, 2, 5, 11	11, 12	14	6,7	7		9	10
5. oral & written presentation		13		6, 7	6,7		9	10
6. handle information technology		11, 12				8	9	
7. introduce new skills in meteorology			14	15		8		10
8. execute meteorological research		13			7			

1. Structure of the meteorology B.S. program conforms to American Meteorological Society standards.
2. Structure of the meteorology B.S. program conforms to National Weather Service standards.
3. With proper choice of electives, students qualify for positions classified as “meteorologist” in the federal employment classification system.
4. Pre-test/post-test assessment instruments are employed in three of the five core courses in the curriculum.
5. A comprehensive assessment instrument is applied at the end of the series of core courses, overlapping each of the course-specific assessment tools.
6. Students and internship supervisors are asked to address specific knowledge and skill criteria in their summary reports.
7. Student capstone or honors projects are evaluated on the basis of a “research paper,” writing assessment rubric that evaluates content as well as writing.
8. External advisement panels and alumni focus groups provide feedback on curriculum structure, knowledge and skills needs, and industry employment prospects.
9. Employer and internship supervisor surveys document ability of NIU students, per needs of employment organization.
10. Alumni survey documents perceived value of NIU degree, success in qualifying for degree-related employment, use of degree knowledge & skills in current employment.
11. Pedagogic standards for several areas of the core curriculum stipulate specific textbooks, applications exercises, data sources, instrumentation experience, and analytical methods.
12. As part of the synoptic meteorology sequence, students regularly participate in externally sponsored, structured analytic exercises (e.g., National Forecasting Contest).
13. Electives coursework in applied climatology and applied meteorology provide students with structured, real-world applications and/or research problems and experience in working with various types of “clients.”
14. Quantitative scores from the department’s standard “Student Evaluation of Instruction” instrument provide a consistent basis for students’ evaluations of their own skill development.
15. Students are asked to identify own skill strengths & weaknesses in relation to internship experiences, and any additional skills they acquire through the internship experience

## **Attachment I: GEOG 391, Student Internship Final Report**

Internships provide valuable “education-to-career” experience, where students can apply what they have learned in their program of study to real world problems faced by geographers and meteorologists. It also provides students with the opportunity to observe active professionals, identify skill and knowledge field requirements, and assess their own strengths and deficiencies.

As part of the structured internship through the Department of Geography (GEOG 391), students are required to submit a typewritten paper summarizing their experience. This document will be submitted to a faculty person who will read and evaluate it, grading on the S/U scale. After the document has been reviewed by the faculty member and revised by the student, a copy of the student’s report will be presented to the internship supervisor at the sponsoring organization for their review and records. Copies of the student’s and supervisor’s reports will be filed in the Department of Geography office and used for assessment and/or program review purposes.

As part of the paper, the faculty of the Department of Geography would like students involved in an internship to address the following questions. Your answers will help us understand how useful off-campus experiences are to your development as a student as well as identify ways to improve our academic programs.

### *Questions/Issues to be addressed by student:*

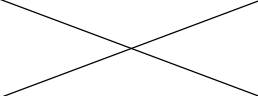
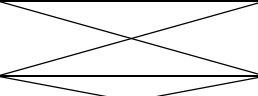
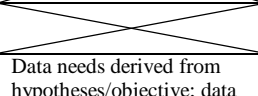
1. Briefly describe the sponsoring organization, the office or section in which you worked, the start and end dates of the internship, and how frequently you participated (worked) at the organization sponsoring the internship.
2. Summarize the activities and/or functions of the office or section in which you interned. How do these activities or functions utilize geography or meteorology? How could they better utilize the knowledge and/or skills geography or meteorology offers?
3. Summarize the various “hands-on” activities in which you were involved during the internship. How do these relate to your education? What role did your supervisor have in these activities, or in preparing you to complete them? What skills were expected of you; what additional training did you receive?
4. How did your academic program help to prepare you for this internship? What skills or knowledge from your education did you use in the internship? How important were each of the following to this internship?
  - a. communication skills (oral and written)
  - b. computational / quantitative skills
  - c. critical thinking / problem solving skills
  - d. specific technical skills (e.g., forecasting, GIS, spatial analysis, ...)?What courses were especially beneficial in preparing you for this internship? What courses or content material would have better prepared you for the internship?
5. What was the value of the internship-- to you, specifically and how might it be valuable to other students? How would you have changed the internship experience or your own preparation if you had the chance? Has the internship experience changed your career goal or reshaped your career direction? What has the internship taught you about yourself, your skills, and your educational background?

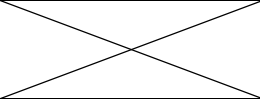
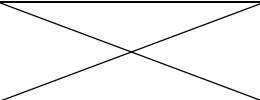
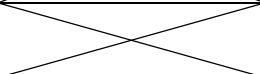
## Attachment II: A General Rubric for the Evaluation of Written Assignments

Department of Geography

Course #: Student's \_\_\_\_\_  
 Name: Written \_\_\_\_\_  
 assignment: \_\_\_\_\_

Date: \_\_\_\_\_

	<i>Importance</i> Essential=4 High=3 Medium=2 Low=1 n.a.=0	Exemplary 5 pts	Proficient 3 pts	Weak 1 pt	Unsatisfactory 0 pts	Score Importance × rating
<b>I. Structure</b>						
<b>Introduction</b>						
- general problem		Context focused and very suited to objective	Context well suited to objective	Context poorly suited to objective or too broad	Context missing or not appropriate to assignment	
- specific problem		Very clearly identifies purpose/objective	Purpose/objective identifiable	Purpose/objective not easily discernable	Purpose/objective not indicated	
- motivation		Imaginative, well-argued, engages reader enthusiasm	Sound, encourages reader interest	Pedestrian, does not encourage reader	Unfocused, detracts from reader interest	
<b>Background</b>						
- relevance to topic		Imaginative or innovative use of literature, in addition to conventional background	All background clearly relevant to topic	Some background irrelevant/poorly connected or missing	Major omissions in background and/or poorly connected to topic	
- comprehensive source(s)		Extensive use of literature, beyond standards for this field	Thorough use of appropriate literature	Some sources of literature missing or used inappropriately	Major omissions in source material, or improper use of sources	
- conceptual organization			Background discussion well organized and logically coherent	Weak or underdeveloped organization; few errors relating sources	Background discussion poorly organized; improper links of unrelated material	
- understanding of field		Exceptional understanding & presentation of background	Sound understanding & presentation	Understanding and/or presentation shallow	Pedestrian, shows limited understanding of field	
<b>Research Design</b>						
- hypotheses/objectives			Hypotheses/objectives fully & clearly stated in testable format	Hypotheses/objectives clearly stated	Hypotheses/objectives not clear, or not full stated	
- source(s) of data			Data source documented and explained	Source of data identified and documented	Source of data not identified/documented	
- description of data/experiment		Data needs derived from hypotheses/objective; data quality addressed	Data needs clearly identified in relation to hypotheses/objective	Data needs identified, but not related to hypotheses/objectives	Data needs not identified, not tied to hypotheses/objectives	
- description of methods		All measurement tools, data compilation, and analytic methods clearly described	Majority of tools and methods identified and described in detail	Tools & methods identified, not described in sufficient detail	Description of tools and methods either incorrect or incomplete	

	<b>Results</b>						
	- answers hypotheses/objectives		Thorough presentation of results extending beyond hypotheses/objectives	Thorough presentation & specifically related to hypotheses/objectives	Results presented, but not related to hypotheses/objectives	Results incomplete, not related to hypotheses/objectives	
	- interprets results		Careful & thorough interpretation of results, recognizes limits of experiment design & methods of analysis	Thorough interpretation of results, suited to experiment design & analytic method	Interpretation complete but not in sufficient depth	Interpretation incomplete or incorrect	
	- use of tables/graphics		Tables/graphics very well designed, easy to follow, and used actively in discussion of results	Tables/graphics fully document important results & used partially in discussion	Tables/graphics used to document results, not discussed	Tables/graphics missing, incomplete, poorly designed	
	<b>Conclusion</b>						
	- summary		Summarize main points in thorough, concise, and coherent manner	Summarizes main points in a coherent manner	Summarizes some portions	No summary, or grossly incomplete	
	- implications		Relates findings to issues beyond the purpose and motivation of assignment, logically coherent	Relates findings to purpose and motivation behind assignment, logically coherent	Attempts to relate findings to purpose and/or motivation	No attempt to relate findings to purpose or motivation, or implications logically unsound	
<b>II. Grammar</b>							
	<b>Organization/structure</b>		Very well organized, sections properly differentiated & appropriate	Well organized, may need fewer/more sections	Weak structure; too many or too few sections	Poorly structured, major problems in differentiating sections	
	<b>Grammatical errors</b>		Very well written, no errors	Well written, few and/or minor errors	Minor errors	Poorly written, numerous and/or serious errors	
	<b>Flow</b>						
	- within paragraphs		Subject of each paragraph clear. Paragraphs easily read and understood apart from remaining text	Subject of paragraphs clear in most cases. Most paragraphs easily read & understood apart	Subject of paragraphs not particularly clear, not separable from body of text	Paragraphs unstructured – no consistent subject, awkward flow	
	- within sections		Clear and easy progression from one paragraph to the next	Progression from one paragraph to next nearly always clear & easy	Some abrupt progressions between paragraphs	Flow between paragraphs choppy or disjoint	
	- between sections			Bridging clear & coherent; no forward or backward references	Bridging weak or awkward; use of forward/backward referencing	Bridging absent; excessive use of forward/backward referencing	
	<b>Misspellings/typography</b>		No misspellings or incorrect choice of words	Very minor misspellings or few incorrect words	Modest number of misspellings or incorrect words	Excessive misspellings and/or incorrect word use	
	<b>Sentence structure</b>			Short, properly structured sentences; no punctuation errors	Few problems with run-on/incomplete sentences; few punctuation errors	Major problems with run-on or incomplete sentences and/or punctuation	
	<b>Voice/verb tense</b>			Correct voice and verb tense used throughout	Few errors with voice or verb tense	Written in 1 <sup>st</sup> person and/or inconsistent verb tense	

<b>III. References</b>							
	Bibliographic information		<del>Assignment complete and above expectations</del>	Complete & properly formatted	Minor formatting errors	Inconsistent or incorrect bibliographic format	
	Citation match		<del>Assignment complete and above expectations</del>	All cited materials properly referenced	Several citations missing or unreferenced	Bibliography missing or incomplete	
	Source(s)		<del>Assignment complete and above expectations</del>	All sources appropriate to purpose of assignment	Most sources appropriate to assignment	Improper source material	
	Vintage		<del>Assignment complete and above expectations</del>	All sources up-to-date	Most sources up-to-date	Source material severely outdated	
<b>IV. Gross Errors</b>							
	Completeness		Assignment complete and above expectations	Assignment complete and meets expectations	Assignment complete but below expectations	Assignment incomplete or not based on directions	
	Tardy		<del>Assignment complete and above expectations</del>	Assignment submitted on time	Assignment tardy	Assignment not submitted, or excessively tardy	
<b>V. Summary evaluation</b>							
V.	Summary evaluation		Exemplary, well beyond expectations of assignment	Proficient, within expectations and standards for assignment	Marginal, errors and omissions correctable, more effort required	Unsatisfactory, poor effort, poor overall performance	