New Course Request

Check Appropriate Boxes: Undergraduate credit [X] Graduate credit □ Professional credit □

1. School/Division: CLAS
2. Academic Subject Code: GEOL
3. Course Number: G219 (must be cleared with University Enrollment Services)
4. Instructor: H. Scott
5. Course Title: Meteorology
   Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)
6. First time this course is to be offered (Semester/Year): Spring 2005
7. Credit Hours: Fixed at _______ or Variable from _______ to _______
8. Is this course to be graded S-F (only)? Yes [X] No
9. Is variable title approval being requested? Yes [X] No
10. Course description (not to exceed 50 words) for Bulletin publication: P: MATH-MI15 or equivalent. Basic concepts of atmospheric dynamics and meteorology, with emphasis on developing an understanding of weather, climate, and forecasting.

11. Lecture Contact Hours: Fixed at _______ or Variable from _______ to _______
12. Non-Lecture Contact Hours: Fixed at _______ or Variable from _______ to _______
13. Estimated enrollment: _______ of which _______ percent are expected to be graduate students.
14. Frequency of scheduling: [X] in 2 yrs Will this course be required for majors? [X] n/a
15. Justification for new course: replaces use of variable - title GEOL G490 for this course
16. Are the necessary reading materials currently available in the appropriate library? [X] yes
17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.
19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

[Signature]
Date 7/30/04

Department Chairman/Division Director

Approved by:
[Signature]
Date 10/15/04

Dean of Graduate School (when required)

[Signature]
Date

Chancellor/Vice-President

[Signature]
Date

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UP 724 University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
Desired Course Number: GEOL-G 219

Meteorology
Sample Syllabus

Anticipated: Spring 2005

Instructor: Dr. Henry P. Scott
Email: hpscott@iusb.edu
Office: NS 345
Phone: (574) 520-5527
Online: http://oncourse.iu.edu

Office Hours: Set times TBA, but readily available by appointment


Course Description (3 cr, Prerequisite: MATH M115): This course will cover the basic concepts of atmospheric dynamics and meteorology. Emphasis will be placed on developing an understanding of weather, climate and the principles used for forecasting. Physical and thermodynamic concepts such as the coriolis force, adiabatic compression and heat capacity will be discussed in detail. Laboratory style exercises will be incorporated into lectures.

Course Requirements and Evaluation: Grades will be based on exams (75%), quizzes (15%) and participation (10%). There will be four exams, including the Final, which will be equally weighted. Missed exams may not be made up for any reason, but the lowest exam score will be dropped from the exam average. Quizzes may be given in class or as take home exercises. Quizzes will be given on an approximately weekly basis and may not be made up if missed, but the lowest score will be dropped from the quiz average. There will be in-class activities (laboratory style exercises); attendance for these will be the primary factor in the participation portion of the grade.

The use of Oncourse is required: important course announcements, the lecture and exam schedule, lecture notes, this syllabus, and grades will all be available online. Note, however, that although I will do my best to make in-class announcements (such as quiz dates) available online, you are responsible for all announcements made in class. Similarly, although I will make my PowerPoint slides available online, you are responsible for all class and reading material regardless of whether or not it is covered in the slides.

Grading Scale: Letter grades will be given based on the following scale: 100-90% = A, 89-80% = B, 79-70% = C, 69-60% = D, and <60% = F. The designation of +/- may be added to the final grade at my discretion. Extra credit will not be available.

Academic Integrity: I follow the guidelines for the Student Code of Conduct in terms of academic dishonesty, i.e. No Cheating!

Accommodations: Any student who feels that an accommodation may be needed based on the impact of a disability should contact Disabled Student Services at 520-4135 in office 148 of the Administration Building. Staff will work to coordinate reasonable accommodations for students with documented disabilities.
## Major Topics:

| Introduction                  | • Basic definitions of weather and climate  
|                              | • The atmosphere as part of the Earth system 
|                              | • Atmospheric composition 
|                              | • Thermal and compositional structure |
| Earth-Sun Relationship        | • Motion of Earth about the sun and orientation of Earth’s rotation axis 
|                              | • Seasonal/geographic variation of solar radiation on surface |
| Energy, Heat and Temperature  | • Forms of energy 
|                              | • Temperature vs heat 
|                              | • Heat Transfer: conduction, convection, radiation 
|                              | • Stefan-Boltzman and Wien’s Displacement Laws 
|                              | • “Greenhouse Effect”: wavelength-dependent absorption and reflection |
| Temperature                   | • Temperature measurement 
|                              | • Controls on temperature 
|                              | • Daily temperature variations 
|                              | • Global temperature variation |
| Moisture and Atmospheric Stability | • Phase diagram of water 
|                                | • Latent heat 
|                                | • Humidity (definitions and measurements) 
|                                | • Ideal Gas Law 
|                                | • Adiabatic compression 
|                                | • Stable vs unstable thermal structure in the atmosphere |
| Condensation and Precipitation | • Cloud formation: moisture content and growth of droplets 
|                                | • Classification of cloud types (altitude and morphological distinctions) 
|                                | • Fog, dew and frost 
|                                | • Formation and types of precipitation 
|                                | • Precipitation measurements and efforts to control |
| Air Pressure and Winds        | • Pressure structure of the atmosphere with elevation 
|                                | • Causes and consequences of lateral pressure variation 
|                                | • Pressure gradient force 
|                                | • Coriolis Force 
|                                | • Geostrophic Flow |
| Atmospheric Circulation and Air Masses | • Global circulation: single-cell and three-cell models 
|                                | • Observed circulation patterns 
|                                | • Local circulation 
|                                | • Classification of air masses |
| Weather Patterns              | • Polar-Front Theory 
|                                | • Fronts 
|                                | • Cyclone formation and travel |
| Severe Weather                | • Thunderstorms and lightening 
|                                | • Tornadoes 
|                                | • Hurricanes |
| Weather Forecasting           | • Data gathering and weather map construction 
|                                | • Short range and long range forecasting 
|                                | • Use of satellites for modern forecasting |
| Climate Change                | • How is climate change detected? 
|                                | • Natural vs anthropogenic causes 
|                                | • Long term consequences |