



Incorporating the AMS Online Weather Studies Resources In the Design of a New Meteorology Course



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BACKGROUND

Geography Curriculum Development

- HSI with diverse student population
- Need for updated and expanded course offerings
- Need for both flexible delivery and dynamic content

Distance Learning and Technology Fluency

- All courses incorporate technology components
- Many courses offered in both traditional and Internet-only formats
- Use technology to enhance course content and delivery, engage students

EDUCATIONAL SETTING

Allan Hancock College is a public community college serving a 3,000 square mile area on the Central Coast of California. The college offers degrees and certificates in more than 100 areas of study in 11 academic departments. Credit enrollment is approximately 11,000 students per semester. The one-college district has campuses in Santa Maria, Lompoc, Vandenberg Air Force Base, and Solvang. The Santa Maria campus consists of 105.6 acres, including 9.6 acres at south campus. The Lompoc Valley Center is a 54,442 square-foot, multimillion-dollar facility offering students state-of-the-art instruction. It is located on 156 scenic acres at the north end of Lompoc.

Recent improvements to the main Santa Maria campus include both new construction and renovation of many older buildings. Opening in 2007, the new Science/Health Occupations Complex offers state-of-the-art laboratory facilities (shown in the upper photo below) while the new Technology & Instructional Equipment Modernization program provides needed equipment upgrades for existing computer labs (lower photo).



COURSE DEVELOPMENT

Course development includes a detailed course outline, a new course proposal, and a general education application, along with a curriculum development statement for the librarian. Required information includes both administrative information to support transfer justification, and a detailed course outline, example exercises, and textbook & additional reading information. In addition to library review for appropriate resource support, the review process includes coordination within and between departments, as well as a formal presentation to the Academic Policy and Planning Committee, appropriate deans and department heads, and other faculty and interested parties.

The new course has adopted the AMS textbook and investigations manual to support the lecture and laboratory portions of the course, including suggested readings by Donald Ahrens and Richard Alley. Additional planned activities include:

- COMET modules on modeling and forecasting for specific customers
- Career night with presentations by local working meteorologists (broadcast, WFO, aviation & range)
- Web-based discussion of course activities and other topical events of interest

The course catalog description and high-level semester outline and anticipated durations (with sub-levels removed) are shown below.

“An introduction to the physical processes underlying atmospheric and weather phenomena, including global climate change and the impacts of various weather and climate phenomena on society. Topics include thermodynamic processes in the moist terrestrial atmosphere; radiation (solar-terrestrial) and heat budget; atmospheric stability and convection. The dynamics of the atmosphere and ocean, along with their general circulation patterns are described. Both synoptic and mesoscale meteorology, as well as factors involved in weather forecasting are discussed, including basic observations, data analysis, and modeling.”

	WEEKS
1. The Atmosphere – an Introduction (mainly descriptive)	1
2. Energy, Radiation, and Atmospheric Optics (mainly descriptive)	1
3. Seasonal and Daily Temperatures	1
4. Air Pressure	1
5. Thermodynamics of Water Vapor and Moist Air	2
6. Hydrostatic Stability and Convection	2
7. Motion on a Rotating Earth	2
8. Dynamics of the Atmosphere	2
9. Weather Systems and Forecasting	3
10. Climate and Human Impacts	1

Course materials include not only traditional textbook and supplemental reading and exercise materials, but also the primary Online Weather Studies (OWS) web site, as well as additional Internet resources. Other important aspects to consider include coordination with other departments and current/future curriculum development plans, as well flexibility in the course definition. Access to appropriate technology is also a factor, both for classroom use and for students; classroom computers with live Internet access can be particularly effective in utilizing both the OWS data and other resources, however student access is also key, whether at home or on campus. The new course is designed to be offered in multiple formats, from traditional classroom to Internet-only, including hybrid variations. Similar existing courses are shown below.

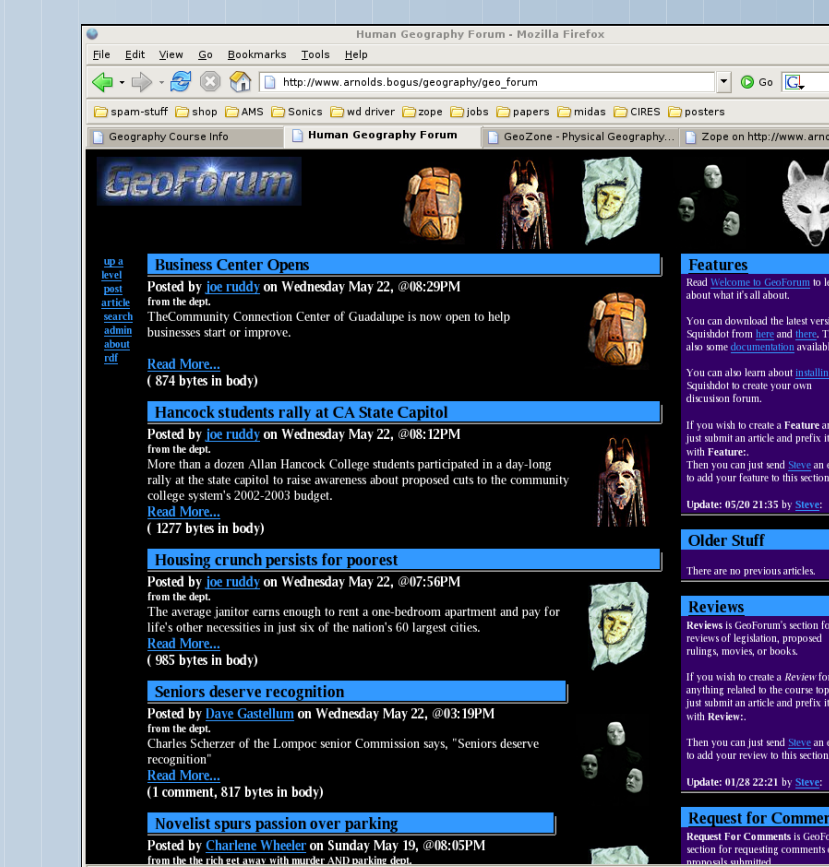
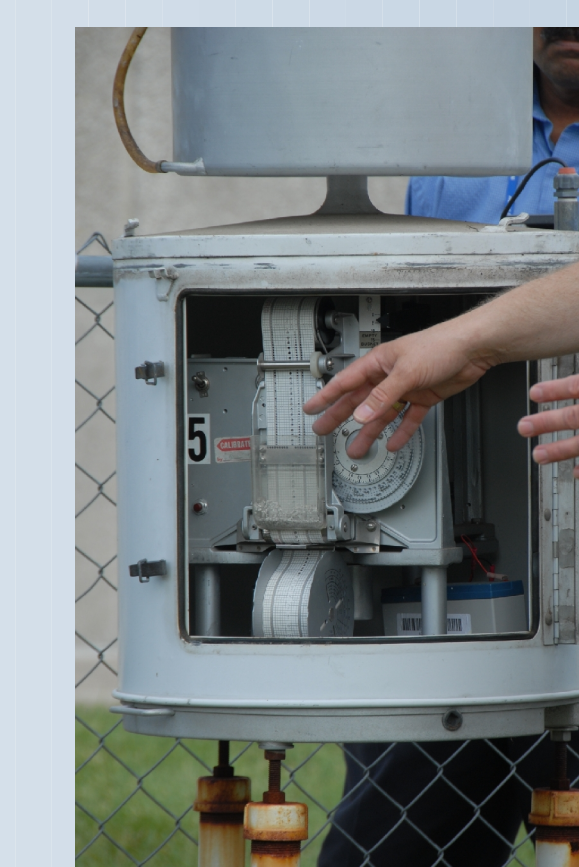
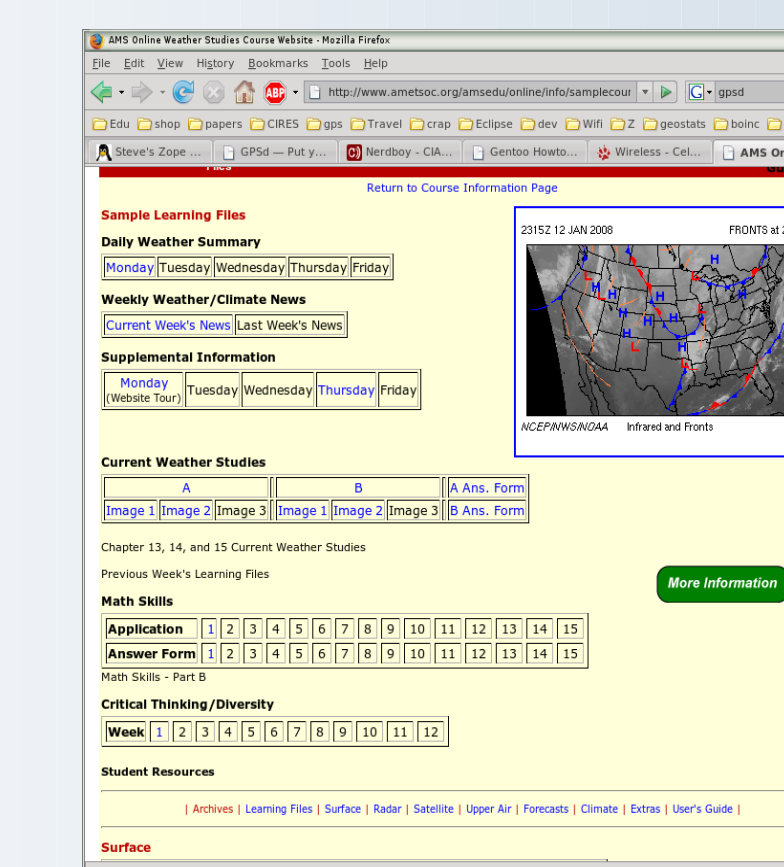
System	CAMPUS	NAME OF PROGRAM	COURSE PREFIX/NUMBER	MAJOR/MINOR/ELECTIVE
UC	Los Angeles	Atmospheric, Oceanic, and Env. Sciences	A&O SCI 3	All
CSU	San Jose	Meteorology	METR 010	All
OTHER	Palomar College	Geography	GEOG 110	All

CONCLUSIONS

Online Weather Studies is an ideal tool to enhance the lecture and/or the laboratory components of both existing and new courses, as well as support hybrid and full distance learning courses. Both students and faculty benefit from the AMS support services, including the faculty workshops, mentoring, and regular updates to the course web site. The Diversity Project is also an important component in attracting faculty from smaller schools and districts.

Coupled with additional program development activities, the new meteorology course can serve as the foundation for a full program in Geography, as well as enhance the distance learning and traditional educational opportunities for all students.

An important key to enhancing student success is fostering both collaborative communication and a "learning" community, whether online or in the classroom.



WHY METEOROLOGY?

The purpose of this course, with or without the AMS online content, is to equip the student with the knowledge and skills to not only understand and interpret weather and climate issues as reported online, in the evening news, or elsewhere, but also to provide the student with a toolkit of critical thinking skills whose usefulness will go beyond this class. These skills will prove helpful in other coursework as well as in everyday life. In many cases, the application is made to diversity in culture and society in general and to worldviews not necessarily of the student's own. In conjunction with the AMS Diversity Project, there can also be significant opportunities for both students and faculty to interact with other researchers and working meteorologists, as well as hands-on work with current meteorological data and related topical issues.

REFERENCES

Allan Hancock College Curriculum Development Guide (2005) Academic Policy and Planning Committee, Allan Hancock College, Santa Maria, CA.

Open Source Technologies in Science Education: What's Your Geek IQ? (2005) S. L. Arnold, presented at the Joint Session on Cyberinfrastructure to Support Atmospheric and Oceanic Education: Examples and Strategies, 14th Symposium on Education, 85th Annual AMS Meeting, San Diego, CA.

Weather Studies: Introduction to Atmospheric Science (2006) Moran, Joseph M., 3rd Edition, American Meteorological Society.