

University of Alaska New Program Proposal
Board of Regents Proposal

Bachelor of Arts in Geography
Bachelor of Science in Geography
University of Alaska Southeast

Submitted by the UAS Natural Sciences Department, Michael Stekoll, Ph.D., Chair

Program Development Committee

Eran Hood, Ph.D., Chair, Associate Professor of Environmental Science

Sanjay Pyare, Ph.D., Assistant Professor of Environmental Science

Cathy Connor, Ph.D., Professor of Geology

Matt Heavner, Ph.D., Associate Professor of Physics

Kevin Krein, Ph.D., Associate Professor of Philosophy

Dan Monteith, Ph.D., Associate Professor of Anthropology

Degrees

Bachelor of Arts in Geography/Environmental Studies and Bachelor of Science in Geography/Environmental Resources

Background and Educational Objectives

The proposed degrees would be offered under the aegis of the University of Alaska (UA) Geography Program. We are proposing two new UA Geography degrees at the University of Alaska Southeast that meet specific academic and student needs and complement existing academic strengths at UAS. These degrees are a B.A. in Environmental Studies and a B.S. in Environmental Resources. Both degrees would share a common core of geography classes with existing UA Geography Degrees offered by UAF and would take advantage of environmental studies classes as well as geography classes currently being offered at UAS, largely as part of the B.S. in Environmental Science. As such, both proposed degree options complement existing UAF degrees being offered through the UA Geography Program. Both of the proposed degrees would provide UAS students with a solid foundation in geography and environmental studies/processes that has a liberal arts focus. The curricula in these degree options will produce graduates ready to gain employment in natural resources, secondary school education, environmental consulting, or tourism as well to attend graduate school. These degrees both allow for focused study in geography and environmental studies and yet allow flexibility for breadth of study in other areas.

A critical aspect of the proposed degrees is that they leverage existing classes in the Environmental Science Program as well as environmentally oriented classes in Biology, Social Science and Humanities to create a new set of degree offerings that will be valuable for both retaining and recruiting students at UAS. The core of the current B.S. in ENVS at UAS includes many classes that are standard offerings in geography/environmental studies programs at other schools. These include Environmental Science 101 (taught with an Introduction to Physical Geography curriculum), Geographic Information Science, Hydrology, Geomorphology, Remote Sensing, and Atmospheric Science. In addition, there are a suite of environmentally themed classes in the Humanities and Social Science programs at UAS that fit naturally into the proposed degrees. The core of the two geography degrees we propose will consist of five classes and is identical to the core requirements in degree programs in geography through the UA Geography Program at UAF. Of the five core classes, four will be offered at UAS and one (GEOG 101) will be offered distance through either UAF or UAS-Ketchikan. The proposed degrees will also leverage existing UAS offerings in the following disciplines: Anthropology, English, Social Science, Biology, and Math. The new degrees have been designed so that they will not compete directly with any existing UAS degree and will most likely add to enrollments in both lower and upper division Environmental Science classes as well as environmentally-themed classes in humanities and social science.

The degrees will be appealing to those with interests in human and spatial dimensions of environmental sciences and with an interest in teaching, policy, management, or natural resource administration. For example, the degrees are ideal for students who want to work in resource management with agencies such as the US Forest Service or the Alaska Department of Natural Resources. In addition, these degrees (particularly the B.A. option) would provide middle-school and secondary-school teachers who require a content degree in addition to broad training in other liberal arts and sciences. These teachers will be able to follow a course of study that will allow them to become “highly qualified” to teach physical sciences as well as be versatile in other classes, a need that well serves rural Alaska. The B.A. option is also well suited for individuals who wish to pursue an advanced degree in social science or humanities such as natural resource policy, environmental literature, natural resource management, or environmental economics. The B.S. option is well suited for individuals who wish to pursue an advanced degree in geographic or environmental science. Students with both of these degrees would also be excellent candidates for entry-level careers in eco-tourism or natural resources such as park ranger, environmental consultant, natural resource specialist, or GIS technician, to name a few careers in this discipline. Students may wish to combine a minor, certificate program, A.A.S. or double major in order to suit their interests. For example, students interested in eco-tourism may wish to pursue an Outdoor Skills and Leadership certificate in combination with the B.A. in Environmental Studies, whereas someone who wants to work in natural resource management may wish to concentrate on a Geographic Information Science curriculum within the B.S. in Earth Systems Science degree. Both degree options, and particularly the B.A. in Environmental Studies, offer greater flexibility than the B.S. in Environmental Science and will provide appealing degree options for students who do not plan to continue graduate studies specifically in Environmental Science.

UAS currently has one physical/environmental science degree: a B.S. in Environmental Science. This is a highly quantitative program that involves extended coursework in Mathematics (through Calculus II), Physics, and Chemistry and is directed towards students who wish to pursue research and graduate studies in related fields. The proposed B.A. and B.S. degrees in Geography/Environmental Studies and Geography/Earth Systems Science will help recruit and, equally importantly, to retain students in environmental science/studies at UAS. The proposed B.A. option in particular will allow students in humanities and social science to pursue an environmentally themed degree that is rounded out by exposure to classes in geographical sciences. The proposed B.S. option is specifically built on a foundation of Environmental Science and Geography courses that are currently offered through the B.S. in ENVS. These courses focus on the processes and spatial dimensions of earth systems such as the hydrosphere, lithosphere and biosphere. Currently, many students leave the ENVS degree program, and often UAS, because there are no environmental degree options outside of the existing B.S. in ENVS that has a relatively narrow focus. The degree options proposed here leverage existing resources and provide additional breath of programs built upon existing faculty expertise in the Environmental Science degree. This will help UAS to retain students that are currently leaving the ENVS program and also to better train students that want to work in the numerous state, federal, and private sector environmental jobs that require

training in geographic techniques (GIS and remote sensing) and environmental systems such as hydrology and geomorphology.

The proposed degree options should also help with recruitment because they will offer place-based degrees in geography with emphases in environmental studies and geospatial science that will appeal to a much broader spectrum of students than the current B.S. in ENVS, which is more focused toward students seeking to attend graduate school. The proposed B.A. in Environmental Studies will also serve to replace the B.L.A. General Studies for local students who are interested in geography and environment-human relations and want a liberal arts degree with flexibility. Moreover, because the first 1-2 years of study are relatively similar for the proposed B.A. in Geography/Environmental Studies and B.S. in Geography/Earth Systems Science and the existing B.S. in Environmental Science, it will be relatively easy for students to transition between the three programs. As of Spring 2009, there are about 40 active majors taking courses in the ENVS program. While it has grown in recent years, the enrollment in the Environmental Science Program at UAS has not reached its potential largely because of the lack of options for students that want degree options in Natural Resources/Geography that are not highly quantitative and focused on pursuing graduate degrees in Environmental Science. The proposed B.A. and B.S. offerings diversify training opportunities for students at UAS without requiring additional new resources in the short term because of the close cross-MAU collaboration with the UA Geography Program and the integration of courses in existing UAS programs.

Many universities offer a B.A. in Environmental Studies or Geography in addition to B.S. degrees in Environmental Sciences because these degrees serve different groups of students. The B.S. in ENVS provides a foundation in science in combination with general education courses and Environmental Science (Biology, Earth Science, Chemistry, and Geology) and Math courses. The proposed B.S. in Geography/Earth Systems Science would similarly offer a foundation in science, but would replace the Physics and Chemistry and some of the Math in the current ENVS degree with Geography and Environmental Systems Science courses. The proposed B.A., in contrast, would provide less science and mathematics and more of a focus on environmental courses in humanities and social science. In addition the B.A. would allow much greater breadth in liberal arts, and substantial flexibility to pursue a minor, certificate, or double major. The proposed degree options are designed to broadly serve the needs of three groups of undergraduate students. First, the B.A. in Environmental Studies is designed to serve students preparing to enter graduate school in teaching, humanities, social science, or business. The degree reflects the requirements for teaching certification in secondary-school Physical Science. Second, both degrees are designed to serve students seeking entry-level employment in the fields related to natural resources, including positions at state and federal agencies. Third, both degrees will serve students who are interested in environmental science and geography but want greater breadth in their liberal arts education (compared to the B.S. in ENVS) and may seek employment in the tourism industry or other natural resource-related areas.

The proposed degree options are similar to the B.S. in ENVS in that they are designed to capitalize on the unique natural setting and natural resources in Southeast Alaska. Many of the courses involve hands-on field and laboratory exercises that take full advantage of the local environment which includes intact coastal temperate rainforest, glaciers and salmon streams in close proximity to campus.

Relevance to the University Mission

The Environmental Science program has long been one of the flagship programs of UAS. Creating additional, closely related degree offerings in Environmental Studies and Environmental Resources reinforces this position and provides the potential to reach a broader audience of students. Thus, the proposed B.A. and B.S. degrees further the following core values of the UAS mission:

- *Achieving distinction as a learning community*
This new degree will help UAS to achieve distinction as a learning community by increasing the number of Bachelor's degrees granted from UAS.
- *Developing programs rooted in its unique natural setting*
UAS Environmental Science and Geography courses take advantage of the "outdoor" classroom by providing field trips and outdoor laboratories in most courses. Juneau is rich in natural resources and provides ample opportunities for hands-on study of environmental systems such as glaciers, forests, and wetlands.
- *Contributing to the economic development of the region and the state through basic and applied research and public service*
UAS students enrolled in the proposed degrees will have unique opportunities to participate in faculty research, both basic and applied. This experience will provide them with valuable experience for gaining employment or attending graduate school after completion of their degree.
- *Forging dynamic partnerships with other academic institutions, governmental agencies and private industry*
UAS students in these degree programs will be employed as interns/research assistants at local agencies such as the US Geological Survey, the US Forest Service, and the Army Corps of Engineers that currently partner with the UAS ENVS Program to provide employment and training opportunities for students.

Collaboration with Other MAUs within University of Alaska

Tight collaboration with the UA Geography Program at UAF is critical to the success of the proposed degrees. At the outset of these degree programs, UAF has agreed to provide one required courses for UAS students via distance delivery (see attached letter of support in Appendix C from Mike Sfraga, UA Geography Program Director). In addition, portability will be a cornerstone of the proposed degrees with the idea that the UA Geography Program will co-market geography degree offerings at UAF and UAS and will work to ensure that students have ample opportunities to study at both MAUs during the course of their degrees. Two specific examples illustrate the idea of portability:

- i) As part of the establishment of these degrees, UAS and UAF have developed 5 Foundation Courses that unify the academic degrees between the two institutions. The Foundation Courses will be required of geography students at both institutions so that students will have the basic discipline grounding required for advanced study. Students at UAS and UAF will then select either a BS or BA track - selecting emphasis areas where available. A common Foundation sequence also allows for seamless mobility between the campuses - as well a unifying framework for the faculty in Southeast and Fairbanks. UAF has implemented the Foundation Course sequence and has students enrolled in this UAGP model. UAS will rename and number the common Foundation Courses sequence so that they match the current offerings at UAF. This will ensure that students in the UA Geography Program can move seamlessly between the two MAUs.

- ii) UAS faculty supporting these degree programs will develop a “UAS Regent's Semester” in Southeast (Juneau) targeted toward UA Geography students at UAF who want to spend time at UAS and take advantage of offerings related to the environment of southeastern Alaska during their Geography Degree Program. The “UAS Regent's Semester” will be integrated into the UAS six year plan and will allow UAF students to take maximum advantage of Geography classes that are unique to southeast Alaska such as Snow Hydrology, Glacier Surveying, and Glaciation and Climate Change. UAF faculty in the UA Geography Program have agreed to design an analogous “UAF Regent's Semester” for UAS students in the two proposed degrees that want to take advantage of geography classes that are unique to interior Alaska. These "Regent's" semesters will be advertised as part of all of the degrees in the UA Geography Program that are offered through UAF and UAS.

Other Universities with Similar Programs

There are numerous universities with degree programs in both Environmental Studies and Environmental Resources. Our proposed degrees are unique in that they are centered around a core of geography courses and thus are able to take advantage of the strengths of both Environmental Science/Studies and Physical Geography programs offered at other schools (examples below). Additionally, the proposed degrees are highly complementary to three degrees currently being offered through the UA Geography Program at UAF: the B.A. in Geography and B.S. degrees in 1) Environmental Studies and 2) Landscape Analysis and Climate Change Studies. The proposed B.A. in Geography/Environmental Studies and B.S. in Geography/Environmental Resources degrees at UAS will share a common core such that beginning students will not immediately need to decide which degree track to pursue. As is the case at other schools with B.A. and B.S. tracks in Environmental Studies and Geography, the proposed B.A. program leaves more flexibility for choosing electives, for adding a minor, or for having a double major. The B.S. degree requires more physical and geospatial science and

mathematics. We have reviewed the curricula at the following universities that offer related B.A. and B.S. degrees in Geography and Environmental Studies:

- University of California, Santa Barbara, CA
- University of Colorado, Boulder, CO
- Western Washington University, Bellingham, WA
- Lewis and Clark, Portland, OR

Our proposed degrees are similar to B.A. and B.S. degrees at the universities above in several ways. The quantitative requirements for our degrees are consistent with what is required for B.A. and B.S. degrees at these schools. In addition, all of the comparable degrees at these schools require a core of environmental studies/geography courses that require a combination of physical and social sciences similar to our degree. Moreover, our focus on Geographic Information Science is consistent with other geography degrees. Finally, the B.A. degrees at these schools offer sufficient choices in upper division breadth courses to allow students to follow a course of study that is either focused on: 1) Human/Environment relations or 2) Physical Science/Earth Processes, which is similar to our B.A. degree.

Demand for Programs

There is high demand for these degree programs from the student perspective and also from the community and state perspective. The continued growth of the ENVS degree coupled with the high number of students that identify themselves as ENVS pre-majors upon entering UAS demonstrate strong student interest in environmental science-related fields at UAS. In 2008, the UAS Dean of Arts and Sciences signed a memorandum of understanding with the UA Geography Program (Attached as Appendix E) to develop one or more geography degrees in partnership with the UA Geography Program. At that time, three students who were planning to leave the ENVS program at UAS were offered the option of a B.S. in Geography/Landscape analysis degree, with graduation through UAF if necessary. All three students accepted the offer and one, Clif Miller, will now graduate with a UAF degree in 2009. The other two students hope to become the first two Geography/Landscape Analysis graduates from UAS in 2010. This example illustrates strong student interest for the degrees and highlights the potential that these degrees have for retaining students that currently leave UAS after dropping out of the B.S. degree in Environmental Science. This example also highlights the value of the close cross-MAU collaboration between UAF and UAS with respect to geography. It is anticipated that UAS will be able to recruit additional students in addition to increasing the retention rate of current students with these new degrees in Geography because these degrees offer more choices for students interested in environmental degrees that provide training in geographic sciences. The proposed degrees also offer more flexibility to include study in other disciplines with a minor, certificate, or double major. Students enrolled in the B.L.A. general studies degree with an emphasis in Natural Science at UAS often express interest in a more-broadly focused environmentally-oriented degree.

Within the state of Alaska, there is a need for students to be broadly trained in environmental systems and resources because the majority of the income in the state is derived from natural resources. One-sixth of the state's economy comes from traditional natural resources, such as fishing, timber, mining, and agriculture, while two-thirds is dependent on oil and the federal government. Moreover, many of the federal government jobs are in natural resource fields. Many disciplines, such as environmental policy, natural resource economics, science writing, natural resource administration all require a solid foundation in Geography/Environmental Studies as well as advanced study in social science, humanities or business. Jobs in many natural resource-related fields are well suited to the proposed degrees combined with breadth in other areas. Positions in environmental consulting, eco-tourism, nature photography, or other natural resources fields, such as park ranger, forest ranger, resource specialist, forestry technician are abundant in Alaska.

The creation of a B.A. in Geography/Environmental Studies, and to a lesser degree the B.S. in Geography/Environmental Resources, at UAS is also responsive to nationwide and statewide demands for science teachers at the secondary level. Within the state of Alaska, there is a need for broadly trained teachers. *No Child Left Behind* legislation calls for "Highly Qualified" middle and high school science teachers who can teach in more than one field. "Highly Qualified Teachers" must have a bachelor's degree with credits equivalent to a major in the subject they teach, and in rural settings common in Alaska, science teachers often must be able to teach in multiple subjects. The flexibility within these degree programs allows students to be trained broadly in liberal arts and science, yet still have a content degree in physical science and, therefore, meet the demand for rural educators to teach in more than one field.

Schedule of Implementation

AY 2008-2009: The Natural Sciences department approves the degree and obtains approval from the UAS Faculty Senate, the UAS Curriculum Committee, and the Board of Regents.

AY 2009-2010: The first class of students is admitted to the B.A. in Environmental Studies and B.S. in Landscape Analysis degree programs. Existing B.S. in ENVS students have the option to select this new degree. Because required courses for the first two years are very similar between the existing B.S. in ENVS degree and the proposed degree tracks, it will be easy for existing students to switch to the new degrees. Additionally, because several UAS students are already working toward the B.S. in Landscape Analysis degree, we expect that we will graduate at least two students in the new degree program.

AY 2010-2011. Assuming that in 2009, some of the existing students in their third year of the B.S. in Environmental Science switch to the new degree tracks, the first students in the new B.A. will graduate and additional students in the B.S. degree will graduate with degrees from UAS in the UA Geography Program.

Projection of Enrollments

Presented in the tables below are estimates of UAS and ENVS program enrollment as well as UAS, Natural Science, and ENVS graduated students. In AY 2006 117

Bachelor's degrees were awarded at UAS in Arts and Sciences and 6 (5%) of these were in ENVS. We have two students that will convert directly into the proposed B.S. degree and graduate in 2010 (Table 2). We anticipate that other students will convert from the existing B.S. in ENVS to these new degrees in their sophomore or junior year and therefore graduate with this degree the year after it is instituted. Additionally, we anticipate seeing increases in the total number of degrees in Environmental Science and Geography based on both increased retention and increased recruitment because of the wider range of degree options in environmental science/geography. The projected outcome is an increased share of total Bachelor's awarded by UAS for students studying in ENVS and Geography.

Table 1. Current and projected (2009-2011) enrollments at UAS.

	2006	2007	2008	2009	2010	2011
Juneau (full and part time students)	2,969	2,599	2,623	2,689	2,756	2,825
UAS (All campuses)	3,978	3,566	3,598	3,688	3,780	3,875

Data from UAS institutional research 2009.

Table 2. Current and projected (2009-2011) degrees awarded. Bachelor's degrees represent a total for UAS Arts and Sciences. Environmental Science and Geography (Environmental Studies and Environmental Resources) represent the existing and proposed degrees. Note that projections are conservative based on less than 5% growth.

	2006	2007	2008	2009	2010	2011
Bachelor's Degrees	117	110	120	125	130	136
BS Environmental Science	6	2	4	5	6	7
* BS Environmental Resources				1	2	3
* BA Environmental Studies				2	5	8
Total Degrees (ENVS and GEOG)	6	2	4	8	13	18

Data from UAS institutional research 2009 and UAS Factbook 2009.

Faculty Resources

Faculty resources are currently sufficient for delivering the majority of the classes in the proposed B.A. and B.S. programs. Existing faculty in the Environmental Science Program all have strong teaching and research credentials within the field of environmental systems science and one faculty member (Hood) has a Ph.D. in Geography. Faculty from the UAS Humanities and Social Science Programs that will contribute courses to the proposed degree are also listed. Successful growth of the program may require additional faculty and teaching assistants in the future to 1) allow all of the courses in the proposed degrees to be offered at UAS and 2) to fulfill student demand for courses. The following UAS faculty members are currently available to the program:

Eran Hood, Ph.D., University of Colorado, Boulder, Associate Professor of Environmental Science, specializes in hydrology and geography.

Sanjay Pyare, Ph.D., University of Nevada, Reno, Assistant Professor of Environmental Science, specializes in Geographic Information Science (GIS) and biogeography.

Cathy Connor, Ph.D., University of Montana, Professor of Geology, specializes in glacial geology and geomorphology.

Matt Heavner, Ph.D., University of Alaska, Fairbanks, Associate Professor of Physics, specializes in environmental sensor webs and atmospheric science.

Sonia Nagorski, Ph.D., University of Montana, Affiliate Professor of Geology, specializes in geochemistry and environmental contaminants.

Kevin Maier, Ph.D., University of Oregon, Assistant Professor of English, specializes in literature and the environment.

Kevin Krein, Ph.D., University of Toronto, Associate Professor of Philosophy, specializes in environmental philosophy and outdoor studies.

Alex Simon, Ph.D., Assistant Professor of Sociology, specializes in environmental sociology.

Brittany Cioni, M.S., University of Arkansas, Term Assistant Professor of Economics, specializes in environmental economics.

Dan Monteith, Ph.D., Associate Professor of Archeology, specializes in archeology of southeastern Alaska.

Library and Other Equipment Needs

Egan Library resources, including serials, books, online databases and other electronic media, are sufficient to support the scholarly resource requirements of the proposed B.A. and B.S. degrees. The library's book holdings include approximately 3500 titles in the principal discipline of earth sciences and the environment. Book collections in related life and environmental sciences are extensive. Licenses for netLibrary and ebrary collections provide full-text searching for more than 600 e-books in the physical sciences and policymaking and many more in related subjects. There are currently 54 journal titles in the environmental and physical sciences. In addition, extensive archival access is available for related geography and earth science journals as well as history of science titles through a JSTOR subscription. In order to provide access to the journal literature, the library maintains subscriptions to 33 bibliographic scientific databases. For articles not available in its print or electronic collections, the library provides exceptional service in processing inter-library loan requests.

New Facilities Needed

No new facilities are needed to implement the program as it will utilize existing Environmental Science Facilities. In particular, the Environmental Science multidisciplinary lab has 26 computers that are equipped with specialized, environmental science oriented software that will support the proposed degrees such as: ArcGIS 9.3, Erdas IMAGINE 9.2, EdGCM (Global Climate Model), BoxCar, Pathfinder Office, Rockware, and Vernier Logger Pro. In addition, the ENVIS program has a variety of GPS equipment available for student use including Garmin handheld units (50), Trimble Pathfinder units (2), and Trimble NetRS units (3).

Projected Costs

No major additional costs are projected for implementing the proposed B.A. and B.S. degree programs. As enrollments increase over time at least one additional Geography faculty member will be needed to offer courses and coordinate the program.

Consultant Reviews

The following individuals have been requested to review the degree proposal. Considerations already received from consultant reviews have been incorporated or accounted for in the current proposal.

- Mike Sfraga, Director, UA Geography Program
- Patricia Heiser, Assistant Professor of Geography, UAF
- James Everett, Interim Provost, UAS

Proposed Curriculum

Bachelor of Arts in Geography/Environmental Studies

The B.A. degree in Geography/Environmental Studies provides students with an interdisciplinary background in the environment that is grounded in geography. Students will develop skills in lectures, seminars and field courses, and their degree will allow for substantial breadth in liberal arts and sciences.

Degree Requirements: Candidates must complete the General Education Requirements (GERs) as well as the specific program requirements listed below for a minimum of 120 credit hours. Courses in a degree program may be counted only once. Courses used to fulfill the major requirements cannot be used to fulfill the GERs. Specific requirements for GERs are listed below. The degree must include 42 credits of upper-division (300 or above) courses. To satisfy the residency requirement, 30 credits must be completed at UA, including 24 upper division credits. Candidates who expect to teach in public secondary schools should seek advising from the UAS School of Education. A C or better is required in all major courses.

Major-- B.A. in Geography/Environmental Studies

1. Complete the UAS GER requirements (36 credits).

Must Include 6-8 Credits of cultural diversity courses from:

World languages, world history, Alaska Native languages, or faculty advisor-approved courses in anthropology, art, communication, literature, and the humanities or social sciences, including transfer or study abroad courses, with an evident focus in cultural diversity.

2. Major Requirements (45 Credits). Students must earn a C or better in all major courses.

- a. Complete the following required Geography foundation courses: 15 Credits
GEOG 101 Introductory Geography (3)
ENVS 101 Introduction to Environmental Science (4)
GEOG 312 Humans and the Environment (3)
ENVS 310 Introduction to GIS (3)
GEOG 490 Geography Seminar (2)

- b. Complete the following Environmental Studies course requirements: 15 Credits

- i) Complete 6 credits in Earth Systems and Geographic Techniques

ENVS 309 Geoscience applications of GPS and GIS (2)
ENVS 403 Remote Sensing (3)
ENVS 410 Advanced GIS (3)
ENVS 420 Atmospheric Science and Climate (3)
ENVS 415 Biogeography (3)
GEOL 301 Geomorphology (4)
GEOL 302 Hydrology (4)

ii) Complete three of the following Human/Environment courses (9 Credits)

- ANTH 342 Arctic Ethnology (3)
- ANTH 408 Ethnobiology (3)
- ECON 435 Natural Resource Economics (3)
- ENGL 303 Literature and the Environment (3)
- PHIL 271 Perspectives on the Natural World (3)
- SOC 404 Environmental Sociology (3)

c. Select a minimum of 15 credits from the following breadth courses:

Physical Geography

- GEOL 300 Geology of Alaska (3)
- GEOL 310 Glaciation and Climate Change (3)
- ENVS 408 Biogeochemistry (3)
- ENVS 404 Snow Hydrology (4)
- ENGL 414 Research Writing (3)

Alaska, Outdoor Studies, and the Environment

- ANTH 314 Archeology of Southeast Alaska (3)
- ANTH 428 Tlingit Culture and History (3)
- ANTH 458 Alaska Native Economic and Political Development (3)
- ENGL 363 Nature Writing (3)
- ENGL 365 Literature of Alaska (3)
- ENGL 370 Native American Literature (3)
- ENGL 423 Ecocriticism (3)
- ODS 243 Outdoor Leadership I (3)
- ODS 244 Outdoor Leadership II (2)

3. Breadth Electives (39 credits).

To include upper division classes as needed. Classes should be selected in consultation with an advisor and students are encouraged to include a minor. No more than 6 credits from the major can be used toward a minor.

PROPOSED CURRICULUM

Bachelor of Science in Geography/Environmental Resources

The B.S. degree in Geography/Landscape Analysis provides students with an interdisciplinary background in the geospatial science and earth system processes that is grounded in geography. Students will develop skills in lectures, seminars and field courses and will be encouraged to develop individual research projects with UAS faculty.

Degree Requirements: Candidates must complete the General Education Requirements (GERs) as well as the specific program requirements listed below for a minimum of 120 credit hours. Courses in a degree program may be counted only once. Courses used to fulfill the major requirements cannot be used to fulfill the GERs. Specific requirements for GERs are listed below. The degree must include 48 credits of upper-division (300 or above) courses. To satisfy the residency requirement, 30 credits must be completed at UA, including 24 upper division credits. A C or better is required in all major courses.

Major-- B.S. in Geography/Environmental Resources

1. Complete the UAS GER requirements (36 credits).

Must include:

Math 200 Calculus I, and a two-course sequence in natural science (Biol 105&106 or Chem 105&106 or Phys 103&104)

2. Major Courses (**must include 39 upper division credits total**)

I. Geography core courses *Complete all* (16 credits)

GEOG 101 Introductory Geography (3)

ENVS 101 Introduction to Environmental Science (4)

GEOG 312 Humans and the Environment (3)

ENVS 310 Introduction to GIS (3)

GEOG 490 Geography Seminar (2)

ENVS 492 Environmental Science Seminar (1)

II. Earth Processes and Environmental Systems *Complete 21 credits*

BIOL 271 Ecology (4)

BIOL 373 Conservation Biology (4)

BIOL 480 Aquatic Pollution (3)

CHEM 350 Environmental Chemistry (4)

ENVS 301 Geomorphology (4)

ENVS 404 Snow Hydrology (4)

ENVS 408 Biogeochemistry (3)

ENVS 415 Biogeography and Landscape Ecology (3)

ENVS 420 Atmospheric Science (3)

GEOL 271 Earth Materials (4)

GEOL 300 Geology of Alaska (3)

GEOL 302 Hydrology (4)

GEOL 310 Glaciation and Climate Change (3)

III. Human/Environment courses *Complete 2 courses (6 credits)*

ANTH 342 Arctic Ethnology (3)
ANTH 408 Ethnobiology (3)
ECON 435 Natural Resource Economics (3)
ENGL 303 Literature and the Environment (3)
PHIL 271 Perspectives on the Natural World (3)
SOC 404 Environmental Sociology (3)

IV. Environmental Management *Complete 3 credits of advisor-approved courses in environmental management.*

V. Geographic Techniques and Quantitative Analysis *Complete 10 credits (must include ENVS 410 and STAT 273)*

ENVS 111 Introduction to Differential GPS (1)
ENVS 309 Mobil GIS Technology and Applications (2)
ENVS 403 Remote Sensing (3)
ENVS 409 GIS Jam: Projects in GIS and Remote Sensing (1-3)
ENVS 410 Advanced Geographic Information Systems (3)
MATH 460 Mathematical Modeling (3)
STAT 273 Elementary Statistics (3)
STAT 401 Regression and Analysis of Variance (4)

VII. Electives (28 credits) *Classes should be selected in consultation with an advisor and must include a minimum of 12 credits of upper division courses.*

Learning Outcomes Assessment

Entrance Assessment

All students at UAS are required to take placement tests or otherwise demonstrate proficiency in reading, writing, and mathematics. Developmental courses are available for students who score below the college level in these areas. The five required core courses required of all majors provide the basic concepts common to all fields of Geography and exposure to the scientific method and scientific writing as they relate to the geographic study of the environment, as well as peer-reviewed scientific literature.

Learning Outcomes by Course Level

The following descriptions serve as learning outcomes for sophomore-, junior-, and senior-level courses in the proposed degrees. These guidelines will serve as a rubric for developing and implementing the program curriculum.

Sophomore-Level Courses

Sophomore-level courses introduce the content area within Geography and do not require advanced knowledge from other areas of science or social science. Course content includes fundamental tenets of both physical and cultural/human geography. In addition, students will be introduced to geographic field techniques such as Global Positioning Systems (GPS) and Geographic Information Science (GIS) that are employed in the field of geography. Students who pass a sophomore-level course will have a basic foundation of knowledge in the course topic. They should also have begun to acquire familiarity with print and electronic library resources.

Junior-Level Courses

In junior-level courses, course content assumes an increasing level of prior knowledge about the field of Geography and students differentiate between the B.A. degree with an emphasis in Environmental Studies and the B.S. degree with an emphasis in Environmental Resources. Course content in either of these tracks will be more specific than that offered on the sophomore level and will assume prior knowledge of geographic fundamentals. Course content may require advanced study in Geography and other areas of Humanities (English), Social Science (Anthropology and Sociology) and Natural Science (Environmental Science, Biology, and Math). Students who pass junior-level courses have demonstrated an ability to master both theoretical and practical concepts in Geography and relevant disciplines. Students should be able to demonstrate an increasingly sophisticated use of library resources and should be able to access the primary scientific literature independently. Students take on increasing responsibility for contributing to and shaping class discussions. Students will also be required to practice verbally presenting their work to an audience of peers.

Senior-Level Courses

Senior-level courses are specific in content, assuming a base of prior knowledge in the field that is both broad and fairly detailed. Students who pass a senior-level course have demonstrated an ability to master detailed information as well as the ability to think critically and evaluate information in the social and/or natural sciences. Students at this level will demonstrate the highest level of proficiency in utilizing library resources; their work will include proper and sophisticated use of documentation and references for research and documentation. They will have taken a leadership role when contributing to class discussion and in presenting their work orally to their peers. Additionally, students will be required to complete an internship or directed research program as a capstone experience.

Program Assessment

The Geography Program Coordinator will facilitate program assessment based on the following:

- Surveying graduating seniors.
- Tracking Geography majors and monitoring student retention.
- Tracking student success through graduate employment or graduate school.
- Reassessment of program needs/improvements on a regular basis, including an annual review of curricular and pedagogical concerns.

Course Descriptions

The following are new courses or existing courses that are undergoing a change of name and/or course number as part of this degree packet. Descriptions for existing courses in the two degrees are listed in Appendices A (B.A. classes) and B (B.S. Classes). Course sequencing for all required and breadth classes for the two proposed majors is shown in Appendix E.

GEOG 490: Geography Seminar

This is a new course being proposed at UAS. It will serve as a capstone seminar for students in both the B.A. and the B.S. degrees. It will be interdisciplinary two credit course. The course description is below:

Interdisciplinary capstone seminar exploring a focused theme or topic from a geographic perspective. Will include contributions of geography to science, philosophy and ethics integrated through detailed review of contemporary literature and/or research.

Prerequisites: senior Geography major or permission of instructor. (2+0)

GEOG 312: Humans and the Environment

This course currently exists at UAS as ANTH 354 Culture and Ecology. This course provides a spatial perspective on Human/Environment relations and the content corresponds to the UAF geography core course Geography 312: Human Geography. As a result, social science faculty at UAS have agreed to change the number course number from 354 to 312 and cross list the course in the geography at UAS. This course will serve as the human geography core course for both the B.A. and the B.S. degrees. The course description/content is not being altered, only the course name and course title.

GEOG 338: Intro to GIS

This is a simple name and number change to match the existing geography core at UAF. We propose to change the existing UAS course ENVS 310: Geographic Information Systems to ENVS 338: Intro to GIS and cross list the course with geography.

Appendix A
Bachelor of Arts in Geography/Environmental Studies

Course descriptions of existing courses:

GEOG F101 Local Places, Global Regions: Introduction to Geography (s) (D-UAF)

3 Credits

Introduction to essential concepts and approaches of geographic study. Explores physical, political, economic and cultural geography of major world culture regions. Examines each region in relation to others, and in context of global economic, political and environmental change. Also available via Independent Learning. (3+0)

**ENVS S101 Introduction to Environmental Science
4 credits (3+3) J GER**

This course examines the atmospheric, hydrospheric, lithospheric, and oceanic systems that define the environment; the interactions among these systems; energy as an environmental parameter; and the effects of physical systems on the biosphere. The labs focus on measurement and description of the environment using methods from meteorology, hydrology, and earth science; Global Positioning Systems; and other relevant field techniques are introduced. Corequisite: MATH S105

**GEOG 312 (Cross list with ANTH S354 Culture and Ecology)
3 credits (3+0) J**

Anthropological approaches to the relationships between sociocultural and ecological systems. Analysis of traditional ecological knowledge, subsistence patterns, and adaptations. Intensive study of selected cases and theories.

**ENVS S310 Geographic Information Systems
3 credits (2+3) J**

Examines the representation of spatial data with vector object models, explores the relationship between spatial data and automated thematic mapping, and trains students in the use of GIS software. Prerequisites: MATH S108 and STAT S273

**ENVS S309 Mobile GIS Technology and Applications
1 credit (1+0) J
2 credits (1+2) J**

Extends students' basic knowledge of GPS and GIS to allow interactive GIS mapping, data collection, and analysis in the field setting. Includes training in the use of handheld computers enabled with GPS and GIS software; design and use of field data collection forms that integrate with GIS; transfer and use of GIS data between desktop and field settings; and the utility of mobile GIS technology in navigation, civil engineering, environmental science, forestry and other fields. Available as ENVS S309A for one credit with no mobile research project, or as ENVS S309 for two credits with a 25 hour mobile research project. Prerequisite: ENVS S110 or S111 pr S310, or instructor permission

**ENVS S403 Remote Sensing
3 credits (3+0) J**

Identification, interpretation and measurement of physical and cultural features using remotely sensed data; image enhancement and analysis; applications of remote sensing to different scientific disciplines; and an

introduction to raster-based Geographic Information Systems. Prerequisites: MATH S107 and completion of any undergraduate introductory science course or permission of the instructor.

ENVS S410 Advanced Geographic Information Systems

3 credits (2 + 3) J

Advanced GIS examines the object models used for the representation of spatially continuous data and the analysis of those data. Specific topics include terrain models; classification; suitability analysis; utilizing imagery; local, focal and zonal functions; surface modeling, and geo-referencing. Prerequisite: ENVS S310 or instructor permission

ENVS S420 Atmospheric Science

3 credits (3+0) J

Explores the physical and chemical workings of Earth's planetary system, recognizing that human development of the planet has a variety of impacts at every scale--locally, regionally, and even globally. Focus is on understanding the atmosphere in terms of energetic, chemical and physical processes. Prerequisite: PHYS S103 or S211 and upper division standing, or instructor permission

ENVS S415 Biogeography & Landscape

3 credits (3+0) J

An introduction to 2 related disciplines that emphasize a geographical focus on natural processes: landscape ecology, the study of large-scale ecological patterns and processes occurring on whole landscapes; and biogeography, the study of species distribution in relation to environmental and historical factors. Students learn how these disciplines serve as foundations for decision-making in land use planning, resource management and biological conservation. Includes lectures the use of geospatial tools like GIS and remote sensing, and hands-on field exercises. Prerequisite: ENVS S101 or BIOL S104 or SIOL S105

GEOL S301 Geomorphology

4 credits (3+3) J

The study of landforms and soils associated with them, including their features, processes, materials and development over time. Emphasis is also placed on the application of concepts and techniques from geomorphology to understanding interactions between human activities and landforms/soils. Prerequisite: Upper division standing, two previous geology courses

GEOL S302 Hydrology

4 credits (3+3) J

Introduction to hydrology emphasizing physical processes and interactions between hydrological phenomena and human activities. Hydrological measurements, data analysis, quantitative descriptions, and field observations are fundamental to this course. Prerequisites: GEOL S104 or S271, MATH S108

PHIL S271 Perspectives on the Natural World

3 credits (3+0) J GER

What is wilderness, and what is our relationship to it? Explore the concepts of nature and wilderness from historical and contemporary perspectives of both Western and non-Western cultures. Conclusions reached will be applied to issues concerning ways in which members of contemporary Western society interact with the wilderness. Completion requires participation in overnight class outings. Prerequisite: ENGL S110 (C or higher) or instructor permission

ENGL S303 Literature and the Environment

3 credits (3+0) J, S

This course surveys the relationship between literature, human culture, and the natural environment. Readings will be selected from diverse traditions and genres. Prerequisite: ENGL S211 (C or higher) and upper-division standing, or instructor permission

ANTH S342 Arctic Ethnology

3 credits (3+0) J

A survey of the cultures of circumpolar regions from Siberia and Alaska to Canada and Greenland. Emphasis on subsistence patterns, ecology, social organization, belief systems, interethnic relations, and contemporary issues. Prerequisite: ANTH S101 or S202 or permission

ANTH S354 Culture and Ecology**3 credits (3+0) J**

Anthropological approaches to the relationships between sociocultural and ecological systems. Analysis of traditional ecological knowledge, subsistence patterns, and adaptations. Intensive study of selected cases and theories. Prerequisite: ANTH S101 or S202 or permission

ECON S463 International Economics**3 credits (3+0) J**

Pure theory of international trade; comparative cost; terms of trade; factor movements; international disequilibrium; balance of payments and its impact on the national economy, capital movements, economic development through international trade. Prerequisite: ECON S201, ECON S202

SOC S375 Current Issues in Sociology: Selected Topics - ENVIRONMENTAL SOCIOLOGY**1–3 credits (variable) J, K**

In–depth exploration of a major timely topic in applied or theoretical sociology.

GEOL S300 Geology of Alaska**3 credits (3+0) J**

Exploration of the tectonic assembly of Alaska using stratigraphic, magmatic, paleontologic, structural, and geophysical data. Modern and ancient volcanic arcs and their role as accretionary markers and metal ore concentrators will be studied. Students will investigate the neotectonics of northeastern Pacific basin, Arctic Ocean and Bering Sea shelf. Precambrian to recent depositional environments and the paleobiology and hydrocarbon concentrations they contain will be considered. Pleistocene glacial and periglacial records and associated landform evolution will be evaluated. Prerequisites: Upper division standing, two previous geology courses, and MATH S108

GEOL S310 Glaciation and Climate**Change****3 credits (2+3) J**

The formation and physics of glaciers, the landforms and depositional record they leave behind, the dynamics of tidewater glaciers and fjord sedimentation. The history of glacial environments from Alaska's Gulf Coasts, Glacier Bay, and on the Juneau Icefield, will be examined for local glacial history. Climate proxy records such as polar ice cores, marine sediment records, glacial deposits, tree rings, and other data sets will be explored. Special emphasis on field work in the Mendenhall Valley to study its glacial history. Prerequisite: GEOL S104. Corequisite: MATH S200 and PHYS S104 or or PHYS S212

ENVS S408 Biogeochemistry**3 credits (3+0) J**

This course deals with how biological and geochemical processes affect element cycles at a variety of spatial and temporal scales. A particular emphasis is given to contemporary research in the biogeochemistry of carbon, nitrogen, sulfur, selected metals, and organic compounds of natural and anthropogenic origin. Prerequisite: ENVS S101, CHEM S106, or instructor permission

ENVS S404 Snow Hydrology**4 credits (3+2) J**

An in-depth look at processes related to snow in midlatitude areas. Topics include snow formation in the atmosphere, snow accumulation and distribution, snowpack metamorphism, avalanche dynamics, snowmelt runoff and chemistry, techniques for measuring snow properties, and case studies. Labs will entail collection

of field data as well as analysis of data. Required labs may take place on Saturday. Prerequisites: Science major with upper division standing

ENGL S414 Research Writing

3 credits (0+0+12) J

This course is designed for students who plan to work on a project in their major field. The instructor regularly critiques students' work and evaluates their completed projects. Students must have proposals prepared when seeking permission to enroll. May be repeated for up to nine credits. Prerequisite: ENGL S211 (C or higher) and upper-division standing, or instructor permission

ANTH S314 Archaeology of Southeast Alaska

3 credits (3+0) J

Examines archaeological discoveries, including recent findings in Southeast Alaska. Archaeological theory and method will be discussed to understand and interpret field work and data. Readings, discussion, and guest lectures will focus on the pre-Euro-American contact period, and the historical archaeology of various industries and commerce.

ANTH S428 Tlingit Culture and History

3 credit (3+0) J

A study of Tlingit culture, reviewing pre-Euro-American contact, social organization, and economic and religious system. Includes a review of Russian and early American occupation of Southeast Alaska and socio-cultural changes experienced by the Tlingit.

ANTH S458 Alaska Native Economic and Political Development

3 credits (3+0)

Examines political and economic institutional development since the Alaska Native Claims Settlement Act of 1971. Assesses the emergence of Alaska Native peoples' political claims of sovereignty, and contemporary issues and conflicts surrounding Native governance.

ENGL S363 Nature Writing

3 credits (3+0) J, S

Study and practice in the techniques of nature writing. Writing techniques will be explored through class discussion, study of literary models, and participation in writing workshops. Classroom instruction may be supplemented by short excursions into the outdoors. Prerequisite: ENGL S261 (C or higher) and upper-division standing, or instructor permission

ENGL S365 Literature of Alaska: Native and Non-Native Perspectives

3 credits (3+0) J

This course explores Alaskan literature: oral and written, traditional and contemporary, Native and non-Native. Course texts will be taken from diverse cultural and geographical areas of Alaska. Special attention will be given to different styles and genres of oral and written literature as well as different social and cultural values embedded in these texts. Prerequisite: ENGL S211 (C or higher) and upper-division standing, or instructor permission

ENGL S370 Native American Literature

3 credits (3+0) J

Explores traditional and contemporary Native American literature in North America. May include traditional oral forms, novels, short stories, film and poetry. Literary texts will be discussed in relation to cultural contexts and interpretations as well as readings in contemporary critical theory. Prerequisite: ENGL S211 (C or higher) and upper-division standing, or instructor permission

ENGL S423 Ecocriticism**3 credits (3+0) J**

An introduction to the theory and practice of ecocriticism. Reading will include the history and theory of environmental literature as well as research in the interdisciplinary fields of environmental philosophy and ecofeminism. Emphasis will be placed on exploring the interplay of human culture with nature in literary texts.

Prerequisite: ENGL S211

ODS S204 Outdoor Leadership**3 credits (3+0) J**

A study of theories of interaction, information sharing, decision making team building and problem solving processes. Theoretical discussions are supplemented by analysis and discussion of risk management issues within the outdoor industry, guest lectures, and relevant readings. Designed as a theoretical and practical foundation for developing a personal and professional leadership style. Prerequisite: Acceptance to ODS certificate or permission

ODS S244 Outdoor Leadership**2 credits (1+2) J**

This progression in the outdoor leadership sequence includes discussions and applications for the outdoor industry, environmental ethics, eco-therapy and adventure education, and also directs training ideas for aerobic and strength fitness. During this class students will develop their plan for the Leadership Capstone. Overnight outings are a required component of this course. Prerequisite: Admission to the ODS certificate program, and ODS S243

Appendix B
Bachelor of Science in Geography/Environmental Resources

Course descriptions of existing courses:

GEOG F101 Local Places, Global Regions: Introduction to Geography (s) (D-UAF)

3 Credits

Introduction to essential concepts and approaches of geographic study. Explores physical, political, economic and cultural geography of major world culture regions. Examines each region in relation to others, and in context of global economic, political and environmental change. Also available via Independent Learning. (3+0)

ENVS S101 Introduction to Environmental Science

4 credits (3+3) J GER

This course examines the atmospheric, hydrospheric, lithospheric, and oceanic systems that define the environment; the interactions among these systems; energy as an environmental parameter; and the effects of physical systems on the biosphere. The labs focus on measurement and description of the environment using methods from meteorology, hydrology, and earth science; Global Positioning Systems; and other relevant field techniques are introduced. Corequisite: MATH S105

GEOG 312 (Cross list with ANTH S354 Culture and Ecology)

3 credits (3+0) J

Anthropological approaches to the relationships between sociocultural and ecological systems. Analysis of traditional ecological knowledge, subsistence patterns, and adaptations. Intensive study of selected cases and theories.

ENVS S310 Geographic Information Systems

3 credits (2+3) J

Examines the representation of spatial data with vector object models, explores the relationship between spatial data and automated thematic mapping, and trains students in the use of GIS software. Prerequisites: MATH S108 and STAT S273

GEOL S271 Earth Materials

4 credits (3+3) J

An introduction to identification of the major rockforming, metal ore, carbonate and evaporite minerals and the rocks they form. Students learn theoretical and practical aspects of crystallography, mineralogy and petrology, and techniques to identify minerals and rocks in both the lab and the field. Includes aspects of mineral chemistry, physical properties, and the igneous, metamorphic, and sedimentary processes that create mineral and rock forming environments. Content is essential for earth science students and for scientists in environmental and health fields. Prerequisite: GEOL 104 and CHEM 105

GEOL S300 Geology of Alaska

3 credits (3+0) J

Exploration of the tectonic assembly of Alaska using stratigraphic, magmatic, paleontologic, structural, and geophysical data. Modern and ancient volcanic arcs and their role as accretionary markers and metal ore concentrators will be studied. Students will investigate the neotectonics of northeastern Pacific basin, Arctic Ocean and Bering Sea shelf. Precambrian to recent depositional environments and the paleobiology and hydrocarbon concentrations they contain will be considered. Pleistocene glacial and periglacial records and associated landform evolution will be evaluated. Prerequisites: Upper division standing, two previous geology courses, and MATH S108

GEOL S301 Geomorphology

4 credits (3+3) J

The study of landforms and soils associated with them, including their features, processes, materials and development over time. Emphasis is also placed on the application of concepts and techniques from geomorphology to understanding interactions between human activities and landforms/soils. Prerequisite: Upper division standing, two previous geology courses

ENVS S420 Atmospheric Science

3 credits (3+0) J

Explores the physical and chemical workings of Earth's planetary system, recognizing that human development of the planet has a variety of impacts at every scale--locally, regionally, and even globally. Focus is on understanding the atmosphere in terms of energetic, chemical and physical processes. Prerequisite: PHYS S103 or S211 and upper division standing, or instructor permission

BIOL S271 Ecology

4 credits (3+3) J, K

Overview of the principles of ecology with emphasis on the organism, population, community, ecosystem and biome levels. Aspects of the physical environment are included in the organismal ecology discussions. Laboratory sessions mainly are field exercises in biological sampling and analyses. Prerequisite: BIOL S105 and either BIOL S106 or ENVS S101. Corequisite: STAT S273

BIOL S373 Conservation Biology

3 credits (3+0) J

An exploration of how biological principles are applied to conserve diversity at all levels of biological organization, from genes to biomes. Prerequisite: BIOL S271

ENVS S404 Snow Hydrology

4 credits (3+2) J

An in-depth look at processes related to snow in midlatitude areas. Topics include snow formation in the atmosphere, snow accumulation and distribution, snowpack metamorphism, avalanche dynamics, snowmelt runoff and chemistry, techniques for measuring snow properties, and case studies. Labs will entail collection of field data as well as analysis of data. Required labs may take place on Saturday. Prerequisites: Science major with upper division standing

ENVS S408 Biogeochemistry

3 credits (3+0) J

This course deals with how biological and geochemical processes affect element cycles at a variety of spatial and temporal scales. A particular emphasis is given to contemporary research in the biogeochemistry of carbon, nitrogen, sulfur, selected metals, and organic compounds of natural and anthropogenic origin. Prerequisite: ENVS S101, CHEM S106, or instructor permission

ENVS S415 Biogeography & Landscape

3 credits (3+0) J

An introduction to 2 related disciplines that emphasize a geographical focus on natural processes: landscape ecology, the study of large-scale ecological patterns and processes occurring on whole landscapes; and biogeography, the study of species distribution in relation to environmental and historical factors. Students learn how these disciplines serve as foundations for decision-making in land use planning, resource management and biological conservation. Includes lectures the use of geospatial tools like GIS and remote sensing,

and hands-on field exercises. Prerequisite: ENVS S101 or BIOL S104 or BIOL S105

GEOL S302 Hydrology

4 credits (3+3) J

Introduction to hydrology emphasizing physical processes and interactions between hydrological phenomena and human activities. Hydrological measurements, data analysis, quantitative descriptions, and field observations are fundamental to this course. Prerequisites: GEOL S104 or S271, MATH S108

GEOL S310 Glaciation and Climate Change

3 credits (2+3) J

The formation and physics of glaciers, the landforms and depositional record they leave behind, the dynamics of tidewater glaciers and fjord sedimentation. The history of glacial environments from Alaska's Gulf Coasts, Glacier Bay, and on the Juneau Icefield, will be examined for local glacial history. Climate proxy records such as polar ice cores, marine sediment records, glacial deposits, tree rings, and other data sets will be explored. Special emphasis on field work in the Mendenhall Valley to study its glacial history. Prerequisite: GEOL S104. Corequisite: MATH S200 and PHYS S104 or PHYS S212

ANTH S314 Archaeology of Southeast Alaska

3 credits (3+0) J

Examines archaeological discoveries, including recent findings in Southeast Alaska. Archaeological theory and method will be discussed to understand and interpret field work and data. Readings, discussion, and guest lectures will focus on the pre-Euro-American contact period, and the historical archaeology of various industries and commerce.

ANTH S342 Arctic Ethnology

3 credits (3+0) J

A survey of the cultures of circumpolar regions from Siberia and Alaska to Canada and Greenland. Emphasis on subsistence patterns, ecology, social organization, belief systems, interethnic relations, and contemporary issues. Prerequisite: ANTH S101 or S202 or permission

ECON S435 Natural Resource/ Environmental Economics

3 credits (3+0) J

Economic analysis of resource uses and development. Topics include economics of renewable resources, forestry, and fisheries; environmental economics, and public resource management. Examples are presented of Alaska resource development and management experience. Prerequisite: ECON S202

ENGL S303 Literature and the Environment

3 credits (3+0) J, S

This course surveys the relationship between literature, human culture, and the natural environment. Readings will be selected from diverse traditions and genres. Prerequisite: ENGL S211 (C or higher) and upper-division standing, or instructor permission

PHIL S271 Perspectives on the Natural World

3 credits (3+0) J GER

What is wilderness, and what is our relationship to it? Explore the concepts of nature and wilderness from historical and contemporary perspectives of both Western and non-Western cultures. Conclusions reached will be applied to issues concerning ways in which members of contemporary Western society interact with the wilderness. Completion requires participation in overnight class outings. Prerequisite: ENGL S110 (C or higher) or instructor permission

SOC S375 Current Issues in Sociology: Selected Topics - ENVIRONMENTAL SOCIOLOGY

1-3 credits (variable) J, K

In-depth exploration of a major timely topic in applied or theoretical sociology.

NRM F290 Resource Management Issues at High Latitudes (D-UAF)

2 Credits

Broad perspective of high latitude resource management issues. On-site analyses of resource management needs, opportunities and/or conflicts in agriculture, forestry, mining, seafood, petroleum, recreation and tourism. Includes 10 day field trip at the end of spring semester. Students must provide own sleeping gear, rain gear and hiking boots. Students must be able to hike forest trails and camp under conditions of inclement weather. May be repeated for credit with instructor's permission. Special fees apply. Prerequisite: Permission of instructor. (2+0)

NRM F300 Internship in Natural Resources Management and Geography (D-UAF)

1 – 6 Credits Offered As Demand Warrants

Supervised pre-professional experience in a business or agency (public or private). Open to students majoring or minoring in natural resources management and geography only. Course may be repeated for credit up to a maximum of 6 credits. Prerequisites: NRM F101 for natural resources management majors or GEOG F101 for geography majors; junior standing with 3.0 GPA; permission of instructor and an approved internship plan. (Cross-listed with GEOG F300.) (1 – 6+0)

ENVS S111 Introduction to Differential GPS

1 credit (1+0) J

An overview of the Global Positioning System; the development of a data dictionary, data acquisition using differential GPS, and integrating GPS into environmental applications.

ENVS S309 Mobile GIS Technology and Applications

1 credit (1+0) J

2 credits (1+2) J

Extends students' basic knowledge of GPS and GIS to allow interactive GIS mapping, data collection, and analysis in the field setting. Includes training in the use of handheld computers enabled with GPS and GIS software; design and use of field data collection forms that integrate with GIS; transfer and use of GIS data between desktop and field settings; and the utility of mobile GIS technology in navigation, civil engineering, environmental science, forestry and other fields. Available as ENVS S309A for one credit with no mobile research project, or as ENVS S309 for two credits with a 25 hour mobile research project. Prerequisite: ENVS S110 or S111 or S310, or instructor permission

ENVS S403 Remote Sensing

3 credits (3+0) J

Identification, interpretation and measurement of physical and cultural features using remotely sensed data; image enhancement and analysis; applications of remote sensing to different scientific disciplines; and an introduction to raster-based Geographic Information Systems. Prerequisites: MATH S107 and completion of any undergraduate introductory science course or permission of the instructor

ENVS S410 Advanced Geographic Information Systems

3 credits (2 + 3) J

Advanced GIS examines the object models used for the representation of spatially continuous data and the analysis of those data. Specific topics include terrain models; classification; suitability analysis; utilizing imagery; local, focal and zonal functions; surface modeling, and geo-referencing. Prerequisite: ENVS S310 or or instructor permission

ENVS S409 GIS Jam: Projects in GIS and Remote Sensing

1 to 3 credits variable (1-3 + 0) J

Project-based instruction in advanced GIS sensing analysis relating to a specific geospatial project or case study. Intended for students who have at least a basic GIS background and a specific project concept in mind. Variable credit (to be determined at time of registration). Each credit requires a certain level of attendance.

Prerequisite: ENVS S110 or S111 or S310, or instructor permission

MATH S460 Mathematical Modeling

3 credits (3+0) J

Introduces the process of developing, analyzing and interpreting mathematical models. Specific areas of application will depend on student majors and/or areas of interest. Topics will be selected from applications of mathematical and statistical methods to the biological and physical sciences. Not repeatable for credit.

Prerequisite: MATH S200

STAT S273 Elementary Statistics

3 credits (3+0) J, K, S

Introduction to data analysis, least-squares regression, data production, sampling distributions, probability, confidence intervals, hypothesis testing. detection and analysis of patterns in data. Prerequisite: MATH S107 or equivalent

STAT S401 Regression and Analysis of Variance

4 credits (3+3) J

A study of multiple regression including multiple and partial correlation, the extra sum of squares principle, indicator variables, and model selection techniques. Analysis of variance and covariance for multi-factor studies in completely random and randomized complete block designs, multiple comparisons and orthogonal contrasts. Prerequisite: STAT S273 or equivalent or higher, or instructor permission

Appendix C: Letter of support from UA Geography Program director Mike Sfraga.

TO: Dr. Eran Hood, UAS
FROM: Dr. Mike Sfraga, UAF/UA
SUBJ: UAGP/UAS Degree Programs
DATE: March 19, 2009

On behalf of the UAF/UAGP faculty, I write to enthusiastically support the proposed geography degree programs at the University of Alaska Southeast. It has been a pleasure to work closely with you over the past two years to fashion a cooperative degree structure. This structure highlights and utilizes the unique faculty expertise at both institutions and will be a rich opportunity for students attending either campus.

The unified Foundation Courses provide a mechanism for our students to seamlessly move from one campus to another; a proposition the UAF faculty fully support. Indeed, we have encouraged many of our students to consider a semester (or two) at UAS, and at last count more than a dozen have indicated a strong interest in this option. We look forward to moving aggressively on this opportunity.

Although our actions signal full support for the UAS geography degrees, I do want to be clear. The UAGP framework allows for individual campus autonomy while leveraging our collective academic expertise and educational opportunities. We do not see the UAS degrees as competitive. Rather, the UAF faculty view these degrees as an integral part of the UAGP and a broadening of geography-related academic opportunities at the University of Alaska.

Dr. Michael Sfraga, Director
909 Koyukuk Drive, Suite 108J
West Ridge Research Building
PO Box 755840
Fairbanks, AK 99775-5840
Phone 907.474.7494
Fax 907.474.7484

Appendix C. Course sequencing for required classes and breadth classes for the B.A. and B.S. degrees in Geography.

No.	Course Title	Campus	Fall 08	Sp 09	Fall 09	Sp 10	Fall 10	Sp 11	Su 11	Fall 11	Sp 12	Fall 12	Sp 13	Fall 13	Sp 14	Su 14
314	Arch of SE Alaska	Juneau	L													
354	Culture and Ecology	Juneau					L								L	
428	Tlingit Culture and Histo	Juneau	L			L										
458	AK Native Econ & Pol De	Juneau				L										
303	Literature & the Environr	Juneau			L					L				L		
363	Nature Writing	Juneau	L				L				L					
365	Lit of AK: Native & Non-N	Juneau	L		L		L			L		L		L		
370	Native American Lit	Juneau		L		L		L			L		L		L	
414	Research Writing	Juneau	ADW													
423	Ecocriticism	Juneau	L				L				L					
101	Intro to Env Science	Juneau	L		L		L			L		L		L		
111	Intro to Diff GPS	Juneau	L	L	L	L	L	L		L	L	L	L	L	L	
310	Geographic Info Systems	Juneau	L		L		L			L		L		L		
403	Remote Sensing	Juneau	L		L		L			L		L		L		
404	Snow Hydrology	Juneau				L					L		L			
408	Biogeochemistry	Juneau		L				L					L			
410	Adv Geographic Info Sys	Juneau		L				L					L			
420	Atmospheric Science	Juneau		L				L					L			
491	Env Science Internships	Juneau	L	L	L	L	L	L		L	L	L	L	L	L	
492	Env Science Seminars	Juneau		L		L		L			L		L		L	
498	Research in Envr Sci	Juneau	L	L	L	L	L	L		L	L	L	L	L	L	
101	Intro to Geography	Ketchikan	D		D		D			D		D		D		
271	Earth Materials	Juneau	L		L		L			L		L		L		
300	Geology of Alaska	Juneau			L					L				L		
301	Geomorphology	Juneau		L							L				L	
302	Hydrology	Juneau	L		L		L			L		L		L		
310	Glaciation and Climate C	Juneau		L				L					L			
315	Glacier Surveying	Juneau	ADW													
460	Mathematical Modeling	Juneau		L		L		L			L		L		L	
206	Outdoor Leadership	Juneau		L		L		L			L		L		L	
271	Perspectives on the Natu	Juneau	L		L		L			L		L		L		
273	Elementary Statistics	Juneau	L	L	L	L	L	L		L	L	L	L	L	L	
401	Regression/Anls of Varia	Juneau	L		L		L			L		L		L		

Appendix D: Memo of agreement between UAS and UA Geography Program (following page)

TO: Dean Pat Brown, UAS
Dean & Director Carol Lewis, UAF

FROM: Dr. Mike Sfraga, Director, UAGP/UAF
Dr. Eran Hood, Associate Professor, UAS/UAGP

SUBJ: UAS/UAF Geography Degree Agreement

DATE: June 2, 2008

We write to thank you for your continued support of the UA Geography Program (UAGP) and propose next steps in the program's ongoing evolution. The UAGP was created to transition UAF's geography degrees to a UA-wide academic program. In short, the UAF degree was to become a broad-based UA degree initiative reflecting faculty expertise, student needs, and campus affinity. A "common core" was established upon which campus-based specialization or emphasis areas would be integrated. In the spring of 2008, UAF course titles, numbers, and content were changed to reflect this new approach. The development of the common core for the UAGP was guided by faculty at all three MAUs and these core courses reflect both UA student needs and UAF's commitment to change existing UA academic paradigms.

Our vision was that a student enrolled at one campus (ex: UAS) would be recognized as a student of that campus (UAS) as well as a student within the broad academic framework know as the UAGP. UAGP faculty (geography, environmental science, environmental studies) at all three campuses would recognize and support all UAGP students.

Our current challenge: A number of students enrolled in the UAS BS, Environmental Science degree desire an alternative to the current BS option. We know that students have left UAS and Alaska because an alternative has not previously been available. Therefore, we provide the following short-term solution that allows UAS students to remain enrolled at UAS - while pursuing a degree in geography under the UAGP framework.

This agreement provides for current UAS students to remain enrolled at UAS, but pursue a BS degree from UAF in Landscape Analysis and Climate Change Studies (one of four UAGP degree options located at the UAF campus). Again, we see this as a short-term solution while we collectively work on a UAS-specific degree option in Geography under the UAGP umbrella.

We share a sense of urgency, and ask for your immediate support of this initiative, as several UAS students have expressed interest in enrolling in this option with the beginning of the fall 2008 semester.

Cc: Chancellor John Pugh, UAS
Chancellor Steve Jones, UAF
Interim Chancellor Brian Rogers, UAF
Provost Susan Henrichs, UAF
Provost Jim Everett, UAS
Assistant Professor Patricia Heiser, UAGP/UAF