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FORMAT 3: Resilience and Adaptation Program Graduate Certificate Application

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Signature _____ Date _____ President, Faculty Senate

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II. Identification of the Program

A. Description of the Program

1. Program title: Graduate Certificate in Resilience and Adaptation Studies
2. Credential level: Graduate Certificate (12 credits)
3. Admission requirements and prerequisites

As a post baccalaureate program, the certificate in Resilience and Adaptation requires admission as a graduate student to an established master's or doctorate program at UAF. A student may receive the certificate without or prior to completing their graduate degree. This certificate will be available to all accepted graduate students, regardless of discipline. It is a defined series of courses that exposes the student to the concepts of resilience and adaptation. While associated with the RAP program, it is not necessary to be a RAP fellow to earn the certificate. Courses will advance knowledge and promote social ecological research in sustainability and resilience. Students working on degrees in the sciences and social sciences will broaden their disciplinary perspective using other disciplines such as economics, ecology, sociology, and culture to gain practical knowledge, training, and integrative skill development. This certificate embodies a holistic perspective that recognizes the importance of both the social and biological dimensions of environmental sustainability and resilience. This certificate is offered by the Graduate School's Resilience and Adaptation Program and will meet the needs of students and professionals.

4. Students may be admitted throughout the academic year. However, beginning coursework fall semester is preferred.
5. Course descriptions of required core courses (6 credits) and approved elective courses (6 credits).

Required Core Courses (6 credits)

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ecological, economic, and social processes. Designed for incoming students of the Resilience and Adaptation Program (RAP) who have not received training in the humanities. Prerequisite: Graduate student enrollment or permission of instructor. (1+0)

ECON616 Economics Background for Resilience and Adaptation

1 credit Offered Fall

Provides the economic background that is necessary for understanding the role of economics in complex systems involving in

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Biological, environmental, and cultural factors and

CCS603 Field Study Research Methods

3 Credits

Focus on techniques for conducting both quantitative and qualitative field research. Particular emphasis on considerations for conducting field research in cross-cultural settings. Prerequisites: Graduate standing or permission of instructor. Cross-listed with EDF603. (3+0)
Documenting Indigenous Knowledge(a)

CCS604 Documenting Indigenous Knowledge(a)

3 Credits Offered Fall

A thorough grounding in research methodologies and issues associated with documenting and conveying the depth and breadth of indigenous knowledge systems and their epistemological structures. Includes a survey of oral and literate data gathering techniques, a review of various modes of analysis and presentation, and a practical experience in a real-life setting. Recommended: Graduate level survey course in research methods or approval of the instructor. Cross-listed with EDF604. (3+0)

CCS608 Indigenous Knowledge Systems(a)

3 Credits Offered Fall

A comparative survey and analysis of the epistemological properties, world views and modes of transmission associated with various indigenous knowledge systems. Emphasis on knowledge systems practiced in Alaska. Prerequisites: Graduate standing or approval of instructor. Cross-listed with RDF608; EDF608; ANLF608. (3+0)

CCS612 Traditional Ecological Knowledge(a)

3 Credits Offered Spring

Examines the acquisition and utilization of knowledge associated with long-term inhabitation of particular ecological systems and adaptations that arise from the accumulation of such knowledge. Attention will be given to the contemporary significance of traditional ecological knowledge as a complement to academic fields of study. Prerequisites: Graduate standing or approval of the instructor. Cross-listed with RDF612 (3+0)

CCS656 Sustainable Livelihoods and Community Well-being

3 Credits Offered Fall

Review the basic principles that govern the sustainability of systems and look at the cultural practices and individual behaviors that enhance or degrade sustainable livelihoods and community well-being. Emphasis is on understanding the historical context of ideas about sustainability, on

understanding the nature and magnitude of the social, economic and ecological dimensions of contemporary change and the "best practices" currently in place for communities to respond effectively to change. Prerequisites: Graduate standing or permission of instructor. Cross-listed with NRMF656 and GEOG656. (3+0)

CCS690 Seminar in Cross-Cultural Studies

3 Credits Offered As Demand Warrants

Investigation of current issues in cross-cultural contexts, practices, and theories. (3+0)

GEOG656



FISH642 Bayesian Decision Theory for Resource Management

4 Credits Offered Spring Even numbered Years

Application of decision theory to problems in natural resource management.

Students will learn to perform Bayesian calculations and uncomplicated decision

analysis themselves. Special fees apply. Prerequisites FISH621 or FISH630 or

permission of instructor. Cross

concurrently). In case of enrollment limits, priority will be given to graduate students in the Resilience and Adaptation program in order for them to be able to meet their core requirements. Cross-listed with ANTH 649, BIOL 649, ECON 649. (3+0).

NRM 668 Resilience Seminar I

1 credit Offered Spring

Provides a forum for students of the Resilience and Adaptation graduate program to explore issues of interdisciplinary research that are relevant to sustainability. The seminar provides support to each student planning his/her summer internship and preparing and presenting a thesis research prospectus. Graded Pass/Fail. Prerequisites: ANTH/BIOL/ECON/NRM 647; ANTH/BIO/ECON/NRM 667; or permission of the instructor. Cross-listed with ANTH 668, BIOL 668, ECON 668. (2+0)

NRM 613 Resilience Internship

2 credits Offered Fall

Students of the Resilience and Adaptation Program may participate in internship to broaden their interdisciplinary training, develop new research tools and build expertise outside their home disciplines. Internships are a full time commitment of four to 10 weeks. Students typically meet fall semester to discuss their internship experiences and make public presentations.

NOR 484 Seminar in Northern Studies

3 credits Offered Fall

An interdisciplinary seminar focusing on topics relating to the North with emphasis on the physical sciences, the peoples, and the socioeconomic and political aspects of the area. Specialists in the various fields will assign readings and conduct discussions. Prerequisites: ENGL 111X, ENGL 211X or ENGL 213X; junior standing; or permission of instructor. (3+0)

NOR 600 Perspectives on the North

3 credits

Basic knowledge of the circumpolar North in the social, economic, political and scientific facets of northern life. Consideration of major cultural groups of the North and their histories, the environmental settings and patterns of settlement and development in northern regions and systems of governance in different northern countries. Broad overview of the major policy issues of the North in education, justice, healthcare, and environmental and wildlife protection. Course is also available on line. Cross-listed with HIST 600. (3+0)

NOR 601 Research Methods and Sources in the North

3 credits Offered Fall

Development of students' research skills so they can engage in their own research on northern issues. Includes techniques of interviewing, conducting surveys and sampling; qualitative and quantitative methods of research design; and familiarity with library sources and archival records. Each student will develop a research project. Course also available online (3+0)

NORS603 Public Policy

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haze and scientific research in the Arctic. Prerequisites: Graduate standing or permission of instructor. Cross-listed with HIST 683. (3+0)

NRM370 Introduction to Watershed Management
3 Credits Offered Fall

The hydrologic cycle and the influence of land management techniques on water quantity, quality and timing. Water yield, soil erosion and non point pollution, and

field trip. /C2_1 1 Tf 0 Tc 3.142 0 Td <IS3D(point)Tj /C2_1 1 Tf 0 Tc <0003>T

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NRM638 GIS Programming
3 Credits Offered Spring Odd numbered Years
GIS programming for ArcView, Arc/Info and ArcGIS Programming techniques for customizing GIS, efficient batch processing and development of custom tools for GIS display and analysis Prerequisites NRMF338 or equivalent. (3+0)

NRM649 Integrated Assessment and Adaptive Management
3 Credits Offered Spring
Interdisciplinary exploration of theoretical and practical considerations of integrated assessment and adaptive management. Concepts important in understanding societal and professional level decision making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. Collectively, the class builds a portfolio of cases and conducts an integrated assessment. Prerequisites: Graduate student standing in a natural science, social science, humanities or interdisciplinary program at UAF or another university or permission of instructor. The course is designed to fit into the sequence of the Resilience and Adaptation program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOLECON/NRM647 and ANTH/BIOLECON/NRM667 (previously or concurrently). In case of enrollment limits, priority will be given to graduate students in the Resilience and Adaptation program in order for them to be able to meet their core requirements. Cross listed with ANTH649; BIOL649; ECON649 (3+0)

BIOL649 Integrated Assessment and Adaptive Management
3 Credits Offered Spring
Interdisciplinary exploration of theoretical and practical considerations of integrated assessment and adaptive management. Concepts important in understanding societal and professional level decision making. Students work as individuals and as a team to undertake case studies with relevance to integrated assessment and adaptive management. Collectively, the class builds a portfolio of cases and conducts an integrated assessment. Prerequisites: Graduate standing in a natural science, social science, humanities or interdisciplinary program at UAF; and permission of instructor. The course is designed to fit into the sequence of the Resilience and Adaptation program's core courses. It is open to other graduate students interested in and prepared to conduct interdisciplinary studies relating to sustainability. Recommended: ANTH/BIOLECON/NRM647 and ANTH/BIOLECON/NRM667 (previously or concurrently). In case of enrollment limits, priority will be given to graduate students in the Resilience and Adaptation program in order for them to be able

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sustainability and provides students a credential recognizing their expertise in this field of sustainability science. The certificate in Resilience and Adaptation prepares interdisciplinary students for careers in academia, industry, government and non governmental

- a. RAP complements and contributes to all other departments, institutes and programs across the UA system.
- b. A RAP certificate provides an academic credential that extends well beyond the RAP program's limited resources. The certificate is expected to generate considerable revenue as students apply creative, holistic problem solving to complex questions.

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Systems with high adaptive capacity reconfigure themselves without losing crucial functions. Systems with low adaptive capacity often sacrifice future options during reconfiguration. RAP students also explore the theory and practice of Adaptive Management, the iterative process of managing systems by using experimentation to learn about system function and reduce uncertainty. Effective adaptive management requires consideration of the social and ecological components of a system.

How do these concepts fit with sustainability science? Sustainability science addresses actions that promote human well-being while conserving the life support systems of our region and our planet. Research on sustainability focuses on the dynamic interactions between nature and society. Building science of sustainability requires a truly interdisciplinary approach that integrates knowledge and practical experience from many different sources. RAP's framework is designed to follow

then adopted as a state line budget item in 2012. The demand and need for the program has been demonstrated over the last 14 years by stable funding, good enrollment and the production of readily employed MS and PhD graduates in various disciplines (See Appendix A).

RAP offers studies in sustainability science as society faces critical decisions about the future of humans and their relationship to the

- b. Budget: no new funds are requested
 - c. Facilities: no facilities are requested
 - d. Credit hour production: 36 distributed across disciplines.
 - e. Faculty: Existing faculty members teach the required or "core" courses.
 - f. Library material: The program only requires standard library services.
- VIII. Relation of Program to other Programs within the System
- a. Effect on enrollments elsewhere: Enrollment in other programs will be increased due to RAP's complementary nature and the interest it generates among prospective students. The tuition generated will be additional income, spread across various departments, since students will be enrolling in 12 additional credits of coursework.
 - b. Duplication in the system: none
 - c. Relationship to research and service
 1. Support and improves research and service
 2. Benefits: increases publications and community partnerships
- IX. Implementation/Termination
- a. Date of implementation: Fall 2016
 - b. Plans for recruiting students
 1. RAP Website <http://www.uaf.edu/rap/>
 2. Professional meetings
 3. Print publication
 4. Graduate school orientation
 - c. Termination: FY2021, if enrollment drops below minimum number of 15 students
 - d. Plans for termination: courses will be offered for two years after last cohort is admitted
 - e. Assessment of program: standard program review as described on the Provost's website.
- X. Regent Guideline Action Request
1. Signature Form
 2. Board of Regents Document
- XI. Draft Prospectus: Follows



Board of Regents Program Action Request
University of Alaska
Proposal to Add, Change, or Delete a Program of Study

1a. UA University (choose one) UAF	1b. School or College Graduate School	1c. Department Program Resilience and Adaptation Program
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2. Complete Program Title Resilience and Adaptation Certificate

3. Type of Program

Undergraduate Certificate Associate

10. Number* of new TA or faculty hires

*Net FTE (fulltime equivalents). For example, if a faculty member will be reassigned to another program, but his/her original program will hire a replacement, there is one net new faculty member. Use fractions if appropriate. Graduate TAs are normally 0.5 FTE. The numbers should be consistent with the revenue/expenditure information provided.

Attachments: Summary of Degree or Certificate Program Proposal Other (optional)

Revised: 04/20/2015

students are adept at building partnerships and initiating collaborative work in an effort to build a more sustainable Alaska.

State needs to be met

Workforce Development RAP students have a good employment track record. They learn to conduct multidisciplinary research, acquire technical expertise from GIS, drone surveillance, and are dedicated to uncovering and sharing knowledge. The majority of RAP students are trained in Alaska.

Budget

Since any student who has an undergraduate degree is eligible to apply for the RAP certificate program, it is expected that enrollment numbers will significantly increase. The certificate is expected to attract both new and existing UA students. Tuition and fees for the six required credits in year 1 (FY18) are expected to generate \$65,700. This estimate is based on tuition and fees for 15 students (eight Alaska residents and seven nonresidents). We anticipate that increased students will apply and be accepted as the program becomes better known. By year 3 we anticipate an enrollment of 30 students generating \$134,205.

Adjuncts are recruited from exceptional upper level RAP graduate students or alumni. Using adjuncts provides advanced students (or alumni) excellent teaching experience at minimal cost. It additionally keeps the program fresh and relevant. Additionally, by offering courses across the university curriculum, the cost of instruction is lowered and the graduate class size is reduced. This cost saving measure allows an increased allocation of state funding to student support in the form of fellowships, travel to professional meetings (network formation) and publication costs (Dissemination of research knowledge gains). Administration: RAP uses the existing administration of UAF's graduate school.

*Resident and nonresident numbers are based on the last three RAP cohorts where 50 percent of accepted applicants were in state and 50 percent were nonresidents.

C. Educational Offerings:

1. Descriptive information of the educational offering(s):

Resilience and Adaptation Studies

Graduate School

907r474r7029

www.uaf.edu/RAP

Graduate Certificate

Minimum requirements for certificate:

Certifica2.AT

The demand and need for the program has been demonstrated over the last 10 years by NSF funding, good enrollment and the production of MS and PhD degrees in various disciplines (See Appendix A). The Resilience and Adaptation Program (RAP) is an interdisciplinary graduate program, focusing on the role of social and ecological systems in sustainability. RAP offers studies in sustainability science as society faces critical decisions about the future of humans and their relationship to the Earth System. Resilience and Adaptation serve as central concepts in exploring the challenges of sustainability. Student research is both "basic" and "applied", transcending disciplinary boundaries by focusing on urgent realworld problems. The RAP graduate program began with an NSF IGERT grant and was recently funded by the University of Alaska Fairbanks beginning FY13. RAP students are prepared for positions in academia, research institutes, governmental agencies, nongovernmental organizations, and indigenous organizations. The activities proposed in this certificate application build on the work accomplished by RAP alumnae and faculty members.

Employment market needs

Survey: completed December 2013

Respondents reported increasing employment opportunities (100%)

"The RAP allowed me to extend my strong natural science foundation into work as a social scientist with a profound understanding of the cultural and economic issues facing Alaskan individuals and

