Graduate Academic Board

Agenda

October 24, 2014
ADM 204
9:30 to 11:30

I. Roll Call

() Arlene Schmuland	() Anthony Paris	() Peter Olsson	() Hsing-Wen Hu	**Ex-Officio Members**
() Cindy Knall	() Dennis Drinka	() Clayton Trotter	() Sam Thiru	() David Yesner
() Jervette Ward	() FS at Large	() FS at Large	() FS at Large	() Lora Volden
() FS CAS				() Scheduling and Publications

II. Approval of Agenda (pg. 1)

III. Approval of Meeting Summary (pg. 2-3)

IV. Administrative Reports

A. Associate Dean of the Graduate School David Yesner

B. University Registrar Lora Volden

C. GAB Chair Arlene Schmuland

V. Program/Course Action Request - Second Readings

Add	ANTH A654	Advanced Studies in Culture and Ecology (stacked with ANTH A454) (3 cr)(3+0)(pg. 4-19)
Chg	AE A681	Frozen Ground Engineering (3 cr)(3+0)(pg. 20-23)
Chg	AE A682	Ice Engineering (3 cr)(3+0)(pg. 24-27)
Chg	AE A683	Arctic Hydrology and Hydraulic Engineering (3 cr)(3+0)(pg. 28-31)
Chg	AE A684	Arctic Utility Distribution (3 cr)(3+0)(pg. 32-35)
Chg	AE A685	Arctic Mass and Heat Transfer (3 cr)(3+0)(pg. 36-39)
Chg	AE A689	Cold Regions Pavement Design (3 cr)(3+0)(pg. 40-43)
Add	AE A698	Arctic Engineering Project (3 cr)(0+9)(pg. 44-47)

VI. Program/Course Action Request - First Readings

Chg	BA A648	Business Intelligence and Data Mining (3 cr)(3+0)(pg. 48-51)
Add	ME A651	Aerodynamics (stacked with ME A451)(3 cr)(3+0)(pg. 52-61)
Add		Doctor of Education in Education, Culture, and Leadership (pg. 62-68)

VII. Old Business

VIII. New Business

IX. Informational Items and Adjournment

Graduate Academic Board

Agenda

October 10, 2014
ADM 204
9:30 to 11:30

I. Roll Call

				Ex-Officio Members
(x) Arlene Schmuland	(x) Anthony Paris	(x) Peter Olsson	(e) Hsing-Wen Hu	(x) David Yesner
(x) Cindy Knall	(x) Dennis Drinka	(x) Clayton Trotter	(x) Sam Thiru	(e) Lora Volden
(x) Jervette Ward	() FS at Large	() FS at Large	() FS at Large	(x) Scheduling and Publications
() FS CAS				

II. Approval of Agenda (pg. 1)
Approved

III. Approval of Meeting Summary (pg. 2-3)
Approved

IV. Administrative Reports

A. Associate Dean of the Graduate School David Yesner
Doctor of Nursing Practice was approved in SAC and will be on the December Board of Regents agenda
Finished final documentation for the Master of Science in Computer Engineering, the transferal letter is read for the Provost and Chancellor to sign. It will proceed to the November SAC meeting
The Doctorate of Education in Education, Culture, and Leadership is being reworked for GAB consideration
Looking at Board of Regents policy for 600-level post-baccalaureate credits to count towards degree

B. University Registrar Lora Volden
Draft III of CIM will come out next week, more information will be provided at the next meeting

C. GAB Chair Arlene Schmuland
Update on the Doctorate of Education, Culture, and Leadership

V. Program/Course Action Request - Second Readings

Chg ANTH A615 Advanced Applied Anthropology (stacked with ANTH A415) (3 cr)(3+0)(pg. 4-13)
Approved for second

Add ANTH A654 Advanced Culture and Ecology (stacked with ANTH A454)(3 cr)(3+0)(pg. 14-29)
Will come back for second read

Chg AE A603 Arctic Engineering (stacked with AE A403)(3 cr)(3+0)(pg. 30-37)
Approved for second

VI. Program/Course Action Request - First Readings

Chg AE A681 Frozen Ground Engineering (3 cr)(3+0)(pg. 38-41)
Chg AE A682 Ice Engineering (3 cr)(3+0)(pg. 42-45)
Chg AE A683 Arctic Hydrology and Hydraulic Engineering (3 cr)(3+0)(pg. 46-49)
Chg AE A684 Arctic Utility Distribution (3 cr)(3+0)(pg. 50-53)
Chg AE A685 Arctic Mass and Heat Transfer (3 cr)(3+0)(pg. 54-57)
Add AE A686 Arctic Engineering Project (3 cr)(0+9)(pg. 58-61)
Accepted with course number change from AE A686 to AE A698
Chg AE A689 Cold Regions Pavement Design (3 cr)(3+0)(pg. 62-65)
All AE courses accepted for first reading

Chg BIOL A662 Advanced Virology (Stacked with BIOL A462)(3 cr)(3+0)(pg. 66-77)
Waived first, approved for second

VII. Old Business

VIII. New Business

IX. Informational Items and Adjournment

A. **Credit Hour Review Process:** In response to a new NWCCU policy on credit hours, an AY14 subcommittee of the UAB and GAB recommended a process to review class scheduling practices relative to approved CAR/CCG credit hours. In Fall 2014 UAA ran a pilot, which focused on traditional face-to-face offerings. After filtering for apparent face-to-face delivery, a total of 143 course sections were sent to the colleges for review. Findings and Actions: Most of the courses integrated nontraditional components, such as a practicum or 0-credit lab, and were found to be in compliance. Sixteen sections were rescheduled to meet the required contact hours. Departments will revise the curriculum documents for nine courses in order to reflect current practice.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	ASSC Division of Social Science	Anthropology

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ANTH	A654	N/A	3	(3+0)

6. Complete Course Title
Advanced Studies in Culture and Ecology

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2015 To: Fall/9999

12. ☐ Cross Listed with _____
☒ Stacked with ANTH A454
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Anthropology MA	10/20/2013	Paul White
2.		
3.		

Initiator Name (typed): Diane K. Hanson Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/31/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/31/2013

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Applies ecological concepts to human societies; examines impacts of environmental change on human societies and of human societies on environments; explores ethnoecology and traditional ecological knowledge of indigenous communities and the values of nature among Western and non-Western societies; and highlights political ecology in the context of the modern world-system and globalization.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate standing and completed undergraduate course in cultural anthropology with a minimum C grade

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Graduate students have need for a course in ecological anthropology that reflects both Western and non-Western (indigenous) approaches to human-environment interaction.

			☐ Approved ☐ Disapproved	Dean/Director of School/College	Date
Initiator (faculty only) Diane K. Hanson Initiator (TYPE NAME)		Date			
☐ Approved ☐ Disapproved	Department Chair	Date	☐ Approved ☐ Disapproved	Undergraduate/Graduate Academic Board Chair	Date
☐ Approved ☐ Disapproved	College/School Curriculum Committee Chair	Date	☐ Approved ☐ Disapproved	Provost or Designee	Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Date of Initiation Date: Fall 2013

II. Course Information

A.	College:	College of Arts and Sciences
B.	Course Prefix	ANTH
C.	Course Number	A654
D.	Number of Credits	3
E.	Contact Hours	3+0
F.	Course Title:	Advanced Studies in Culture and Ecology
G.	Grading Basis:	A-F
H.	Implementation Date	Spring 2015
I.	Course Description:	Applies ecological concepts to human societies; examines impacts of environmental change on human societies and of human societies on environments; explores ethnoecology and traditional ecological knowledge of indigenous communities and the values of nature among Western and non-Western societies; and highlights political ecology in the context of the modern world-system and globalization.
J.	Status of Course Relative to a Degree or Certificate Program:	Elective in the MA Anthropology
K.	Course Fees:	No
L.	Registration Restrictions:	Graduate Standing and completed undergraduate course in cultural anthropology with a minimum C grade
M.	Stacking	ANTH A454

III. Course Activities

In a lecture and discussion format, information will be presented concerning the diversity of ways in which human societies adapt and have adapted to their natural environments and have transformed those environments, from prehistory to the present, in global perspective.

IV. Course Evaluation

Evaluation procedures are at the discretion of the instructor and will be discussed at the first class meeting of the semester. Students will be evaluated on all class content and assigned readings. Evaluation vehicles will include (but are not limited to) examinations, research papers, student journals/reflections, student questions on readings, and class discussions. The requirement for research papers differentiates the undergraduate (A454) and graduate (A654) versions of this course.

V. Course Level Justification

This course provides a thorough and comprehensive opportunity for graduate students to explore ecological anthropology and reflect on both Western and non-Western approaches to human-environment interaction. The course structure requires high-level

critical thinking and effective written and oral communication skills. As a stacked course with undergraduates at the 400-level, ANTH A654 is designed to develop discussion leadership skills in graduate students and to provide the opportunity for graduate students to research in-depth a topic within ecological anthropology of their own interest. Cross-cultural and critical perspectives on the human-environment interaction are critical for a graduate-level education in anthropology.

VI. Instructional Goals and Defined Outcomes

A. Instructional Goals. The Instructor will:

1. Present fundamental ecological concepts and their relationship to human societies
2. Discuss human adaptations from a variety of cultural perspectives
3. Describe the impacts of environmental changes on human societies, and of human societies on their environments
4. Relate the traditions of environmental anthropology and their perspectives on human/environment interactions
5. Present Western and Non-western (Indigenous) perspectives on ecological knowledge

B. Student Learning Outcomes. The Student will be able to:

Student Learning Outcomes:	**Assessment Measures**
1. Apply fundamental ecological concepts to human societies	Examinations, student journals/reflections from class discussions, graded daily questions
2. Analyze the impacts of environmental change on human societies and the impacts of human societies on environments through human history	Examinations, student journals/reflections from class discussions, graded daily questions
3. Explain the various traditions in anthropology and their approaches to understanding human/environment interactions	Examinations, student journals/reflections from class discussions, graded daily questions
4. Interpret different approaches of societies to nature, and the differences and similarities between indigenous environmental knowledge and that of contemporary Western societies	Examinations, student journals/reflections from class discussions, graded daily questions

VII. Topical Outline:

A. Introduction

B. Environmental Anthropology Overview

1. Development and Branches of Environmental Anthropology

2. Steward's Cultural Ecology
3. Beyond Boundaries in Cultural Ecology
4. Ethnoecology
5. System Approaches in Environmental Anthropology

C. Fundamentals of Ecology and Human Biological Ecology
   1. Principles of Cultural Ecology
   2. Human Adaptive Strategies
      a. Hunting and Gathering
      b. Origins of Food Production/Horticulture
      c. Pastoralism/Intensive Agriculture
      d. Modern Models

D. Population & Environment

E. Development & Urbanization

F. Political Ecology
   1. Politics of Knowledge
   2. Knowing the Environment
   3. Biodiversity
   4. Managing the Environment
   5. Gender, Feminism, & Environment
   6. Politics of Global Environmentalism

G. Indigeneity & the Environment
   1. Traditional Ecological Knowledge
   2. Indigenousness & Environmentalism
   3. Indigenous Rights

H. Contemporary Issues in Environmental Anthropology
   1. Health & Environment
   2. Climate Change
   3. Consumption & Globalization

VIII. Suggested Textbooks:

Dove, M., & Carpenter, C. (2008). *Environmental anthropology: A historical reader.* Malden, MA: Blackwell Pub.

Haenn, N., & Wilk, R. R. (eds.) (2006). *The environment in anthropology: A reader in ecology, culture, and sustainable living*. New York: New York University Press.

Moran, E. F. (2010). *Environmental social science: Human-environment interactions and sustainability*. Wiley-Blackwell.

Sutton, M. Q., & Anderson, E. N. (2013). *Introduction to cultural ecology*, 3rd ed. Walnut Creek, CA: AltaMira Press.

Townsend, P. K. (2009). *Environmental anthropology: From pigs to policies*, 2nd ed. Waveland Press.

IX. Bibliography:

Argyrou, V. (2005). The logic of environmentalism: Anthropology, ecology, and postcoloniality. New York: Berghahn Books.

Begon, M., Townsend, C. R., & Harper, J. L. (2006). Ecology: From individuals to ecosystems (4th ed.). Malden, MA: Blackwell Pub.

Berkes, Fikret (2012) Sacred Ecology: Traditional Ecological Knowledge and Resource Management, 3rd ed. New York: Routledge.

Bhasin, V., & Susanne, C. (2010). Anthropology today: Trends and scope of human ecology. Delhi: Kamla-Raj Enterprises.

Biersack, A., & Greenberg, J. B. (2006). Reimagining political ecology. Durham: Duke University Press.

Chacon, R. J., & Mendoza, R. G. (2012). The ethics of anthropology and Amerindian research: Reporting on environmental degradation and warfare. New York: Springer.

Crate, S. A., & Nuttall, M. (2009). Anthropology and climate change: From encounters to actions. Walnut Creek, CA: Left Coast Press.

Ellen, R. F. (2007). Modern crises and traditional strategies: Local ecological knowledge in island Southeast Asia. New York: Berghahn Books.

Ellen, R. F., Parkes, P., & Bicker, A. (2000). Indigenous environmental knowledge and its transformations: Critical anthropological perspectives. Amsterdam: Harwood Academic.*

Hastrup, K., & Olwig, K. F. (2012). Climate change and human mobility: Global challenges to the social sciences. New York: Cambridge University Press.

Hastrup, K., & Skrydstrup, M. (2013). The social life of climate change models: Anticipating nature (1st ed.). New York: Routledge.

Heckler, S. (2009). Landscape, process and power: Re-evaluating traditional environmental knowledge. New York: Berghahn Books.

Hornborg, A., & Crumley, C. L. (2007). The world system and the Earth system: Global socioenvironmental change and sustainability since the Neolithic. Walnut Creek, CA: Left Coast Press, Inc.

Ingold, T. (2012). Toward an ecology of materials. Annual Review of Anthropology, 41(1), 427-442. doi: 10.1146/annurev-anthro-081309-145920

Kelly, R. L. (2013). The lifeways of hunter-gatherers: The foraging spectrum (2nd ed.). Cambridge: Cambridge University Press.

Kennett, D. J., & Winterhalder, B. (2006). Behavioral ecology and the transition to agriculture. Berkeley: University of California Press.

Kopnina, H., & Shoreman-Ouimet, E. (2011). Environmental anthropology: Cross-disciplinary investigations. New York: Routledge.

Leonetti, D., Nath, D., & Hemam, N. (2007). The behavioral ecology of family planning. Human Nature, 18(3), 225-241. doi: 10.1007/s12110-007-9010-4

Leslie, P. W., & Little, M. A. (2003). Human biology and ecology: Variation in nature and the nature of variation. American Anthropologist, 105(1), 28-37.*

Lewis, I. M., Höhne, M. V., & Luling, V. (2010). Peace and milk, drought and war: Somali culture, society, and politics: Essays in honour of I.M. Lewis. New York: Columbia University Press.

Lockyer, J., & Veteto, J. R. (2013). Environmental anthropology engaging ecotopia: Bioregionalism, permaculture, and ecovillages. New York: Berghahn Books.

McElroy, A., & Townsend, P. K. (2009). Medical anthropology in ecological perspective (5th ed.). Boulder, CO: Westview Press.

Molnar, S., & Molnar, I. M. (2000). Environmental change and human survival: Some dimensions of human ecology. Upper Saddle River, NJ: Prentice Hall.

Moran, E. F. (2006). People and nature: An introduction to human ecological relations. Malden, MA: Blackwell Pub.

Neumann, R. P. (2011). Political ecology III: Theorizing landscape. Progress in Human Geography, 35(6), 843-850. doi: 10.1177/0309132510390870

Platten, S., & Henfrey, T. (2009). The cultural keystone concept: Insights from ecological anthropology. Human Ecology: An Interdisciplinary Journal, 37(4), 491-500. doi: 10.1007/s10745-009-9237-2

Rappaport, R. A. (1984). Pigs for the ancestors: Ritual in the ecology of a New Guinea people (A new enl. ed.). New Haven: Yale University Press.*

Ray, R. (2005). Adapting to changing environment: Studies in anthropology. Kolkata: University of Calcutta.

Rival, L. (2006). Amazonian historical ecologies. Journal of the Royal Anthropological Institute, 12, 79-94. doi: 10.1111/j.1467-9655.2006.00274.x

Sillitoe, P. (2007). Local science vs. global science: Approaches to indigenous knowledge in international development. New York: Berghahn Books.

Smith, E. A. and Wishnie, M. (2000). Conservation and subsistence in small-scale societies. Annual Review of Anthropology, 29, 493-524.*

Walters, B. B. (2008). Against the grain: The Vayda tradition in human ecology and ecological anthropology. Lanham, MD: Altamira Press.

Wenzel, G. W. (2004). From TEK to IQ: Inuit Qaujimajatuqangit and Inuit cultural ecology. Arctic Anthropology, 41(2), 238-250.

White, R. D. (1985). American environmental history: The development of a new historical field. Pacific Historical Review, 54, 297-335.**

White, R. D. (2004). Controversies in environmental sociology. New York: Cambridge University Press.

Winterhalder, B. (2002). Behavioral and other human ecologies: Critique, response and progress through criticism. Journal of Ecological Anthropology, 6, 4-23.*

*Classic References

**Sources that illustrate historic development of the field

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	ASSC Division of Social Science	Anthropology

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ANTH	A454	ANTH A354	3	(3+0)

6. Complete Course Title
Culture and Ecology

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☒ Other CCG (please specify)
- ☒ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☒ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2015 To: Fall1/9999

12. ☐ Cross Listed with _____
☒ Stacked with ANTH A654
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Integrative Capstone (Tier 3 GER), p. 87 2012-13 catalog	10/31/2013	Faculty List Serv
2. Environment and Society BA/BS, p. 106, 2012-13 catalog	10/31/2013	Dorn Van Dommelen
3.		

Initiator Name (typed): Diane K. Hanson Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/31/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/31/2013

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☒ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Examines anthropological approaches to the relationships between cultural and ecological systems. Explores culture as an adaptive system and the role of various cultural subsystems in different adaptations. Applies ecological concepts to human societies; impacts of environmental change on human societies, and impacts of human societies on environments; ethnoecology and traditional ecological knowledge of indigenous communities; values of nature among Western and non-Western societies; and political ecology in relation to the juxtaposition of indigenous peoples within contemporary nation-states.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
ANTH A202 minimum grade of C

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) *(non-codable)*

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
This capstone course has been taught at the advanced undergraduate level for the past several years, and its movement to the 400 level reflects its content level as a capstone course in Anthropology.

Initiator (faculty only)	Date	☐ Approved ☐ Disapproved	Dean/Director of School/College	Date
Diane K. Hanson Initiator (TYPE NAME)				
☐ Approved ☐ Disapproved	Department Chair	Date	☐ Approved ☐ Disapproved	Undergraduate/Graduate Academic Board Chair	Date
☐ Approved ☐ Disapproved	College/School Curriculum Committee Chair	Date	☐ Approved ☐ Disapproved	Provost or Designee	Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Date of Initiation Date: Fall 2013

II. Course Information

A.	College:	College of Arts and Sciences
B.	Course Prefix	ANTH
C.	Course Number	A454
D.	Number of Credits	3
E.	Contact Hours	3+0
F.	Course Title:	Culture and Ecology
G.	Grading Basis:	A-F
H.	Implementation Date	Spring 2015
I.	Course Description:	Examines anthropological approaches to the relationships between cultural and ecological systems. Explores culture as an adaptive system and the role of various cultural subsystems in different adaptations. Applies ecological concepts to human societies; impacts of environmental change on human societies, and impacts of human societies on environments; ethnoecology and traditional ecological knowledge of indigenous communities; values of nature among Western and non-Western societies; and political ecology in relation to the juxtaposition of indigenous peoples within contemporary nation-states.
J.	Status of Course Relative to a Degree or Certificate Program:	GER Integrative Capstone BA Anthropology capstone BS Anthropology capstone BS Environment and Society, Society and Environment emphasis Minor, Environmental Studies, List B BS Natural Sciences, Environmental Sciences option, Social Sciences list
K.	Course Fees:	No
L.	Course Prerequisite:	ANTH A202, minimum grade of C
M.	Stacking	ANTH A654

III. Course Activities

In a lecture and discussion format, information will be presented concerning the diversity of ways in which human societies adapt and have adapted to their natural environments and have transformed those environments, from prehistory to the present, in global perspective.

IV. Course Justifications:

A. Justification of course level: This course contains advanced content; it is a synthetic course requiring specialized knowledge

B. Justification for capstone status: This course integrates general knowledge about human cultural adaptations to produce a synthetic but detailed understanding of the long-term history of human-environmental relations, including both environmental impacts on human societies and vice versa, as well as an understanding of distinctions between Western and non-Western approaches to ecological knowledge and values of nature, and a consideration of the ecological circumstances of indigenous peoples embedded within contemporary nation-states.

V. Instructional Goals and Defined Outcomes

A. Instructional Goals. The Instructor will:

1. Present fundamental ecological concepts and their relationship to human societies
2. Discuss human adaptations from a variety of cultural perspectives
3. Describe the impacts of environmental changes on human societies, and of human societies on their environments
4. Relate the traditions of environmental anthropology and their perspectives on human/environment interactions
5. Present Western and non-Western (indigenous) perspectives on ecological knowledge

B. Student Learning Outcomes and Assessment Measures. The Student will:

Student Learning Outcomes:	**Assessment Measures**	**Integrative Capstone Goals**
1. Apply fundamental ecological concepts to human societies	Examinations, student journals/reflections from class discussions, graded daily questions	Knowledge integration, critical thinking
2. Analyze the impacts of environmental change on human societies and the impacts of human societies on environments through human history	Examinations, student journals/reflections from class discussions, graded daily questions	Critical thinking, information literacy, knowledge integration,
3. Explain the various traditions in anthropology and their approaches to	Examinations, student journals/reflections from class discussions, graded daily	Critical thinking, information literacy, knowledge integration

understanding human/environment interactions	questions	
4. Interpret different approaches of societies to nature, and the differences and similarities between indigenous environmental knowledge and that of contemporary Western societies	Examinations, student journals/reflections from class discussions, graded daily questions	Critical thinking, information literacy, knowledge integration

VI. Topical Outline:

A. Introduction
B. Environmental Anthropology Overview
    a. Development and Branches of Environmental Anthropology
    b. Steward's Cultural Ecology
    c. Beyond Boundaries in Cultural Ecology
    d. Ethnoecology
    e. System Approaches in Environmental Anthropology
C. Fundamentals of Ecology and Human Biological Ecology
    a. Principles of Cultural Ecology
    b. Human Adaptive Strategies
        i. Hunting and Gathering
        ii. Origins of Food Production/Horticulture
        iii. Pastoralism/Intensive Agriculture
        iv. Modern Models
D. Population & Environment
E. Development & Urbanization
F. Political Ecology
    a. Politics of Knowledge
    b. Knowing the Environment
    c. Biodiversity
    d. Managing the Environment
    e. Gender, Feminism, & Environment
    f. Politics of Global Environmentalism
G. Indigeneity & the Environment
    a. Traditional Ecological Knowledge
    b. Indigenousness & Environmentalism
    c. Indigenous Rights

H. Contemporary Issues in Environmental Anthropology
    a. Health & Environment
    b. Climate Change
    c. Consumption & Globalization

VII. Suggested Textbooks:

Dove, M., & Carpenter, C. (2008). *Environmental anthropology: A historical reader.* Malden, MA: Blackwell Pub.

Haenn, N., & Wilk, R. R. (eds.) (2006). *The environment in anthropology: A reader in ecology, culture, and sustainable living*. New York: New York University Press.

Moran, E. F. (2010). *Environmental social science: Human-environment interactions and sustainability*. Wiley-Blackwell.

Sutton, M. Q., & Anderson, E. N. (2013). *Introduction to cultural ecology*, 3rd ed. Walnut Creek, CA: AltaMira Press.

Townsend, P. K. (2009). *Environmental anthropology: From pigs to policies*, 2nd ed. Waveland Press.

VIII. Bibliography:

Argyrou, V. (2005). *The logic of environmentalism: Anthropology, ecology, and postcoloniality*. New York: Berghahn Books.

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*Classic References

**Sources that illustrate historic development of the field

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A681	CE A681	3	(3+0)

6. Complete Course Title
Frozen Ground Engineering
Frozen Ground Engineering
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. MS of Arctic Engineering	336	1/24/2014	Hannele Zubeck
2. MS of Civil Engineering	NA	1/24/2014	Osama Abaza
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to physical, thermal, and mechanical properties of frozen soils; frost action; heat flow in soils; thaw behavior of frozen ground; foundations in frozen ground; construction ground freezing; and pavement design, earthwork, and field investigations for frozen ground.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
N/A	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering.

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix. Prerequisite removal: current prerequisite limits the attendance to Civil Engineers only.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Frozen Ground Engineering
C.	Course Subject/Number:	AE A681
D.	Credit Hours:	3.0
E.	Contact:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces students to physical, thermal and mechanical properties of frozen soils; frost action; heat flow in soils; thaw behavior of frozen ground; foundations in frozen ground; construction ground freezing; and pavement design, earthwork, and field investigations for frozen ground.
H.	Status of course relative to degree or certificate program:	Applies to the MS programs in Arctic Engineering.
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering.

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Course Topics

1. Introduction to Frozen Ground
2. Physical and Thermal Properties of Soils
3. Frost Action
4. Heat Flow in Soils
5. Thaw Behavior of Frozen Ground
6. Mechanical Properties of Frozen Soils
7. Foundations in Frozen Ground
8. Construction Ground Freezing
9. Pavement Design
10. Field Investigations and Earthwork
11. Current Research Topics

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will demonstrate how to
   1. Analyze properties of frozen soils,
   2. Analyze frozen soil's behavior under stress and strain,
   3. Design foundations, earth structures and pavements for frozen ground,
   4. Explain how to prepare conference papers.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Define frozen ground and describe its characteristics.	Homework assignments, exams, term paper
2. Assess physical and thermal properties of frozen soils, heat flow and frost heave rates in soils.	Homework assignments, exams, term paper
3. Analyze thaw weakening of frozen soils and estimate thaw settlement.	Homework assignments, exams, term paper
4. Determine strength and creep parameters of frozen soils.	Homework assignments, exams, term paper
5. Design to prevent foundation/pavement failure due to seasonally frozen ground or permafrost.	Homework assignments, exams, term paper
6. Identify important issues in earthwork, field investigations, and construction ground freezing project.	Homework assignments, exams, term paper
7. Author papers acceptable for publication.	Term paper

VIII. Suggested Text

Andersland, O. and Ladanyi, B., 2004. *Frozen Ground Engineering*, 2nd. Edition, ASCE Press, Reston, VA.

IX. Bibliography and Resources

1. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering,* ASCE Press, Reston, VA.
2. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering,* McGraw-Hill, New York, NY.
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4. *Journal of Cold Regions Engineering,* ASCE Press, Reston, VA.
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Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A682	CE A682	3	(3+0)

6. Complete Course Title
Ice Engineering
Ice Engineering
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Arctic Engineering MS Program	337	1/24/2014	Hannele Zubeck
2. Civil Engineering MS Program	NA	1/24/2014	Osama Abaza
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date: _____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to factors governing design of engineering works contending with the presence of ice. Includes fundamental ice properties, ice processes, ice navigation and control of ice in channels, structural and non-structural ice control measures, ice jams, bearing capacity of floating ice sheets, and ice forces on riverine and ocean structures.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
NA	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a mechanics of materials course with a minimum grade of C.

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Ice Engineering
C.	Course Subject/Number:	AE A682
D.	Credit Hours:	3.0
E.	Contact:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces students to factors governing design of engineering works contending with the presence of ice. Includes fundamental ice properties, ice processes, ice navigation and control of ice in channels, structural and non-structural ice control measures, ice jams, bearing capacity of floating ice sheets, and ice forces on riverine and ocean structures.
H.	Status of course relative to degree or certificate program:	Applies to the MS program in Arctic Engineering.
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	None
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a mechanics of materials course with a minimum grade of C.

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Course Topics

1. Physical Ice Properties and Processes
2. River, Lake, and Sea Ice
3. Ice Navigation and Control of Ice in Channels
4. Structural and Non-structural Ice control Measures
5. Ice Jam Processes and Classification
6. Ice Jam Data Collection, Hydraulics, and Mitigation
7. Bearing Capacity of Floating Ice Sheets
8. Ice Forces on Structures and Related Processes
9. Construction of Ice Roads and Bridges
10. Current Research Topics

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will present materials, lead discussions, and assign exercises intended to give students ability to
   1. Analyze properties of lake, river, and sea ice.
   2. Predict behavior of ice under natural conditions.
   3. Evaluate ice forces on engineering structures.
   4. Design ice roads and bridges.
   5. Evaluate bearing capacity of ice sheets.
   6. Predict other ice effects pertinent to safety and efficiency of human endeavors in cold regions.
   7. Explain how to prepare conference papers.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Analyze properties of lake, river, and sea ice.	Homework assignments, exams and term paper
2. Predict behavior of ice under natural conditions.	Homework assignments, exams and term paper
3. Predict ice forces on engineering structures.	Homework assignments, exams and term paper
4. Design ice roads and bridges.	Homework assignments, exams and term paper
5. Evaluate bearing capacity of ice sheets.	Homework assignments, exams and term paper
6. Design ice control and ice jam mitigation measures.	Homework assignments, exams and term paper
7. Predict other ice effects pertinent to safety and efficiency of human endeavors in cold regions.	Homework assignments, exams and term paper
8. Author papers acceptable for publication.	Term paper

VIII. Suggested Text:

USACE, 2002. *Ice Engineering*, EM 1110-2-1612, US Army Corps of Engineers, Washington, DC.

IX. Bibliography and Resources

1. ANSVAPI, 1993. *Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Structures in Ice Environments,* American National Standards Institute/ American Petroleum Institute, Washington, DC. [Classic text].
2. Ashton, G. D., Editor, 1986. *River and Lake Ice Engineering*, Water Resources Publications, Littleton, CO. [Classic text].
3. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGrawHill, New York, NY.
4. McFadden, T., and Bennett, F., 1991. *Construction in Cold Regions- A Guide for Planners, Engineers, Contractors, and Managers*, John Wiley & Sons, Inc., Hoboken, NJ. [Classic text].
5. Ryan, W., and Crissman, R., 1990. *Cold Regions Hydrology and Hydraulics*, ASCE Press, Reston, VA. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A683	CE A683	3	(3+0)

6. Complete Course Title
Arctic Hydrology and Hydraulic Enginering
Arctic Hydrology/Hydraulic Eng
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Arctic Engineering MS Program	337	1/24/2014	Hannele Zubeck
2. AEST MS Program	335	1/24/2014	Rob Lang
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to aspects of hydrology and hydraulics unique to engineering problems of the North. Although emphasis is placed on Alaskan conditions, information from Canada and other circumpolar countries is included.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
NA	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering or physical science, or upper class standing in an accredited undergraduate program in engineering, having completed a water resources course with a minimum grade of C.

17. ☒ Mark if course has fees SCoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic Hydrology and Hydraulic Engineering
C.	Course Subject/Number:	AE A683
D.	Credit Hours:	3.0
E.	Contact Time:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces students to aspects of hydrology and hydraulics unique to engineering problems of the North. Although emphasis is placed on Alaskan conditions, information from Canada and other circumpolar countries is included.
H.	Status of course relative to degree or certificate program:	Applies to in Arctic Engineering MS program and Applied Environmental Science and Technology MS program.
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering or physical science, or upper class standing in an accredited undergraduate program in engineering, having completed a water resources course with a minimum grade of C.

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Outline

A. Review
    1. Units of measure, static fluid behavior, and basics of fluid flow
    2. Principles of dynamic fluid behavior and fundamentals of open channel flow
    3. Fundamentals of hydrology and river hydraulics
B. Ice in hydrologic and hydraulic systems
    1. Ice formation in turbulent and quiescent water
    2. Evolution of river ice
    3. River ice jams overview
    4. Ice jam force balance
C. Modeling river flows with ice effects
    1. Use of the U.S. Army Corps of Engineers Hydrologic Engineering Center's River Analysis System program (HEC-RAS) to model river flows with ice of known thickness and roughness
    2. Using HEC-RAS for wide rivers with ice jams
    3. Using HEC-RAS to estimate ice jam flood levels
D. Effects of snow on Arctic Hydrology
    1. Snow properties
    2. Snowmelt hydrology

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will demonstrate how to
    1. Employ hydrology and hydraulics fundamentals and related physical principles in cold regions.
    2. Consider cold regions natural conditions and engineering challenges, with particular regard to lakes and streams of the north.
    3. Use associated specialized language and units of measure.
    4. Locate, interpret, and apply public information about cold regions precipitation, streamflow, and related physical conditions.
    5. Apply fundamental principles to solve common cold regions hydraulic engineering problems.
    6. Explain how to prepare conference papers.

B. Student Learning Outcomes. Upon completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Recognize natural conditions and engineering challenges that are unique to rivers and streams in cold regions.	Homework assignments, exams and term paper
2. Interpret associated specialized language and units of measure.	Homework assignments, exams and term paper
3. Locate, interpret, and apply public information about cold regions hydrology and related physical conditions.	Homework assignments, exams and term paper
4. Apply physical principles for specialized solutions to cold regions hydraulic engineering problems, including: a. Prediction of river ice growth and decay, b. Analysis of river ice hydraulics, c. Prediction of ice jams and design of mitigation measures, d. Simulation of river flow and water level changes, including effects of ice, using HEC-RAS, and e. Prediction and analysis of snow properties and snowmelt effects on stream flow.	Homework assignments, exams and term paper
5. Author papers acceptable for publication.	Term paper

VIII. Suggested Text

Although no text is required, students are encouraged to download the following free manual from the U.S. Army Corps of Engineers:

US Army Corps of Engineers, 2002. *Ice Engineering*, EM 1110-2-1612, Washington, DC.

IX. Bibliography and Resources

1. Bedient, P., Huber, W., Vieux, B., 2013. *Hydrology and Floodplain Analysis*, Fifth Edition, Pearson, Upper Saddle River, NJ.
2. Chin,D., 2013. *Water Resources Engineering*, Third Edition, Pearson, Upper Saddle River, NJ.
3. DeWalle, D., and Rango, A., 2008. *Principles of Snow Hydrology*, Cambridge University Press, Cambridge, England.
4. Ryan W., and Crissman, R., 1990. *Cold Regions Hydrology and Hydraulics*, ASCE, Reston, VA. [Classic text].
5. Todd D., and Mays, L., 2005. *Groundwater Hydrology*, Third Edition, John Wiley & Sons, Inc., 2005, Hoboken, NJ.
6. US Army Corps of Engineers, 1998. *Runoff from Snowmelt*, EM 1110-2-1406, Washington, DC. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A684	CE A684	3	(3+0)

6. Complete Course Title
Arctic Utility Distribution
Arctic Utility Distribution
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Arctic Engineering MS Program	337	1/24/2014	Hannele Zubeck
2. Civil Engineering MS Program	NA	1/24/2014	Osama Abaza
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date: _____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to physical principles and current practices associated with the planning and design of safe, efficient, and affordable water supply, fire protection, wastewater collection and disposal, and solid waste disposal works in cold regions, with a view toward conditions in rural arctic Alaska.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
NA	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering or physical science, or upper class standing in an accredited undergraduate program in engineering, having completed a water resources course with a minimum grade of C.

17. ☒ Mark if course has fees SCoEng

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved
Dean/Director of School/College Date

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic Utility Distribution
C.	Course Subject/Number:	AE A684
D.	Credit Hours:	3.0
E.	Contact:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces students to physical principles and current practices associated with the planning and design of safe, efficient, and affordable water supply, fire protection, wastewater collection and disposal, and solid waste disposal works in cold regions, with a view toward conditions in rural arctic Alaska.
H.	Status of course relative to degree or certificate program:	Applies to the MS programs in Arctic Engineering
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a water resources course with a minimum grade of C.

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Course Topics

1. Overview of Cold Regions Utilities
2. Planning and Project Development
3. Frozen Ground – Foundations for Utilities
4. Thermal Considerations
5. Water Sources and Development
6. Water Treatment
7. Water Storage
8. Water Distribution
9. Wastewater Collection, Treatment and Disposal
10. Current Research Topics

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. Instructors will present materials, lead discussions, and assign exercises to teach students how to
   1. Plan and design safe, efficient, and affordable water supply, fire protection, wastewater collection and disposal, and solid waste disposal methods in cold regions.
   2. Prepare conference papers.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Use physical properties, mathematics, analytical methods and specialized language necessary for solving water and wastewater system design and analysis problems encountered in cold regions.	Homework assignments, exams and term paper
2. Identify and summarize governing processes associated with freezing and thawing phenomena.	Homework assignments, exams and term paper
3. Locate, interpret, and apply public information about cold regions physical conditions and engineering variables.	Homework assignments, exams and term paper
4. Determine foundation and support conditions and common designs for water and wastewater infrastructure, including piles, post and pad, and frozen foundation designs.	Homework assignments, exams and term paper
5. Author papers acceptable for publication.	Term paper

VIII. Suggested Text:

Smith, D. (Editor), 1996. *Cold Regions Utilities Monograph* [3rd Ed.]. ASCE Press, Reston, VA. [Classic text].

IX. Bibliography and Resources

1. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.
2. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGrawHill, New York, NY.
3. *Journal of Cold Regions Engineering*, ASCE Press, Reston, VA.
4. McFadden, T., and Bennett, F., 1991. *Construction in Cold Regions*- A Guide for Planners, Engineers, Contractors, and Managers, John Wiley & Sons, Inc., Hoboken, NJ. [Classic text].
5. Ryan, W., and Crissman, R., 1990. *Cold Regions Hydrology and Hydraulics*, ASCE Press, Reston, VA. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A685	ME A685	3	(3+0)

6. Complete Course Title
Arctic Heat and Mass Transfer Applications
Arctic Heat/Mass Transfer App
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☒ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☒ Other CCG (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Arctic Engineering MS Program	336	1/24/2014	Hannele Zubeck
2. Engineering BS Program ME	261	12/6/2013	Jeff Hoffman
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduces principles of heat and mass transfer with special emphasis on application to problems encountered in the Arctic, such as ice and frost formation, permafrost, condensation, and heat loss in structures.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
NA	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a thermodynamics course with a minimum grade of C.

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved
Dean/Director of School/College Date

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic Heat and Mass Transfer Applications
C.	Course Subject/Number:	AE A685
D.	Credit Hours:	3.0
E.	Contact Time:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces principles of heat and mass transfer with special emphasis on application to problems encountered in the Arctic, such as ice and frost formation, permafrost, condensation, and heat loss in structures.
H.	Status of course relative to degree or certificate program:	Applies to the Arctic Engineering MS program and Engineering BS program in Mechanical Engineering concentration.
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/SOE/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a thermodynamics course with a minimum grade of C.

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Outline

1. Information Collection
2. Regional Temperature Data
3. Physical Properties of Construction Materials
4. Zone Refining
5. Fundamentals of Heat Transfer
6. Temperature Distribution in Soils
7. Temperature Measurement
8. Foundation Design in Cold Regions
9. Heat Transfer in Structures
10. Heat and Mass Transfer in Buried Pipelines, Roads, and Utilidors
11. Current Research Topics

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will demonstrate how to:
   1. Apply hydrology and hydraulics fundamentals and related physical principles.
   2. Apply physical properties, mathematics including calculus, and analytical methods necessary for solving heat and mass transfer problems encountered in cold regions.
   3. Identify governing processes associated with freezing and thawing phenomena in cold regions.
   4. Use specialized language and units of measure for heat and mass transfer in cold climates.
   5. Locate, interpret, and apply public information about cold regions physical conditions and engineering.
   6. Apply governing principles to solve common cold regions engineering problems,
   7. Apply heat and mass transfer problem solving techniques to analyze roads, buildings, pipelines, and utilidors under cold climate conditions.
   8. Prepare conference papers.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Determine and summarize the mathematical and physical properties governing heat and mass transfer in cold climates.	Homework assignments, exams and term paper
2. Interpret and apply associated specialized language and units of measure.	Homework assignments, exams and term paper
3. Gather specialized scientific and engineering public information about cold regions physical conditions.	Homework assignments, exams and term paper
4. Apply fundamental physical principles in solving common cold regions engineering problems.	Homework assignments, exams and term paper
5. Predict temperature variations in soils based upon	Homework assignments, exams and

climatic and physical soil data.	term paper
6. Determine temperature profiles in structure walls, roof, and foundations.	Homework assignments, exams and term paper
7. Predict moisture content and mass flow rates in structures.	Homework assignments, exams and term paper
8. Determine soil freeze and thaw rates associated with buried pipelines and utilidors.	Homework assignments, exams and term paper
9. Author papers acceptable for publication.	Term paper

VIII. Suggested Text

Freitag D., and McFadden, T., 1997. *Introduction to Cold Regions Engineering*, ASCE Press, Reston, VA.

Additional supplemental material will be gathered as needed from public information sources, such as data from the NOAA's National Climatic Data Center.

IX. Bibliography and Resources

1. Andersland, O., and Ladanyi, B., 2004. *Frozen Ground Engineering*, 2nd. Ed. ASCE Press, Reston, VA.
2. Cengel, Y., and Boles, M., 1998. *Thermodynamics*, McGraw-Hill, New York, NY.
3. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGraw-Hill, New York, NY.
4. Holman, J., 2002. *Heat Transfer*, McGraw-Hill, New York, NY.
5. Incropera, F., and DeWitt, D., 1996. *Heat and Mass Transfer*, John-Wiley and Sons, Hoboken, NJ. [Classic tex].
6. Lunardini, V., 1981. *Heat Transfer in Cold Climates*, Van Nostrand Reinhold, New York, NY. [Classic text].
7. McFadden, T., and Bennett, F., 1991. *Construction in Cold Regions - A Guide for Planners, Engineers, Contractors, and Managers*, John Wiley & Sons, Inc., Hobeken, NJ. [Classic text].
8. Rice, E., 1996. *Building in the North*, University of Alaska, Fairbanks, Alaska.
9. Smith, D., (Editor), 1996. *Cold Regions Utilities Monograph*, 3rd Ed., ASCE Press, Reston, VA. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A689	CE A689	3	(3+0)

6. Complete Course Title
Cold Regions Pavement Design
Cold Regions Pavement Design
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☒ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Master of Science Arctic Engineering	337	1/24/2014	Hannele Zubeck
2.			
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date: _____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Design, maintenance and rehabilitation of pavement structures in cold regions where frost, snow and ice threaten expected service life.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
NA	N/A	N/A

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a tansportation engineering course with a minimum grade of C.

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.

Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Cold Regions Pavement Design
C.	Course Subject/Number:	AE A689
D.	Credit Hours:	3.0
E.	Contact:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Design, maintenance and rehabilitation of pavement structures in cold regions where frost, snow and ice threaten expected service life.
H.	Status of course relative to degree or certificate program:	Applies to the MS program in Arctic Engineering
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a transportation engineering course with a minimum grade of C

III. Course Activities

Faculty presentations, homework assignments, exams, class discussions and activities relating to course's term paper conference.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on homework assignments, exams and term paper.

V. Course Level Justification

Presentations and reading will include advanced scientific and engineering topics that require a background in math and science equivalent to that obtained in a bachelor's degree in engineering.

VI. Course Topics

1. Cold Regions Pavements
2. Pavement Environment
3. Calculation of Engineering Parameters
4. Pavement Deterioration Modes
5. Soil Investigation and Material Testing
6. Design Approaches
7. Mix Design of Bound Layers
8. Pavement Structural Design
9. Maintenance and Rehabilitation
10. Pavements on Permafrost
11. Current Research Topics

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will demonstrate how to:
   1. Apply factors and calculate engineering parameters for pavement design in cold regions.
   2. Analyze failure modes of pavements.
   3. Plan for site investigation and material testing.
   4. Compare alternatives for design and maintenance strategies.
   5. Design pavement surfaces and structures.
   6. Plan maintenance operations, select rehabilitation techniques and seasonal load restrictions.
   7. Design pavements in a permafrost environment.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Analyze factors affecting pavement design in cold regions.	Homework assignments, exams, term paper
2. Analyze failure modes of pavements under the effects of traffic, environmental stresses and the combination of the two.	Homework assignments, exams, term paper
3. Manage site investigations and material testing.	Homework assignments, exams, term paper
4. Evaluate alternatives for design and maintenance techniques, strategies and their financial impacts.	Homework assignments, exams, term paper
5. Manage and perform pavement designs in cold regions.	Homework assignments, exams, term paper
6. Author papers acceptable for publication.	Term paper

VIII. Suggested Text

Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.

IX. Bibliography and Resources

1. Andersland, O., and Ladanyi, B., 1994. *Frozen Ground Engineering*, ASCE Press, Reston, VA. [Classic text].
2. Huang, Y., 2004. *Pavement Analysis and Design*, Pearson, Prentice Hall, Upper Saddle River, NJ.
3. *Journal of Cold Regions Engineering*, ASCE Press, Reston, VA.
4. Vinson, T., Rooney, J. and Haas, W., 1996. *Roads and Airfields in Cold Regions*, ASCE Press, Reston, VA. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A698		3	(0+9)

6. Complete Course Title
Arctic Engineering Project
Arctic Engineering Project
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits 3

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2015 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with _____ Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. MS in Arctic Engineering	337	1/24/2014	Hannele Zubeck
2.			
3.			

Initiator Name (typed): Hannele Zubeck Initiator Signed Initials: _____ Date: _____

13b. Coordination Email Date: 2/4/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 2/4/2014

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Culminating project for MS Arctic Engineering student. The project is arranged among the advisor, graduate advisory committee and student to solve a practical cold regions engineering problem.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
N/A	N/A	N/A

16d. Other Restriction(s)
☐ College ☒ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing in Arctic Engineering with a completion of minimum of 9 graduate Arctic Engineering credits.

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix. This course is added, since the students are currently taking CE A686 Civil Engineering Project.

_____ Initiator (faculty only) Date
Hannele Zubeck
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
_____ Department Chairperson Date

☐ Approved
☐ Disapproved
_____ Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved
_____ Dean/Director of School/College Date

☐ Approved
☐ Disapproved
_____ Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
_____ Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic Engineering Project
C.	Course Subject/Number:	AE A698
D.	Credit Hours:	3.0
E.	Contact:	0+9
F.	Grading Information:	A-F
G.	Course Description:	Culminating project for MS Arctic Engineering student. The project is arranged among the advisor, graduate advisory committee and student to solve a practical cold regions engineering problem.
H.	Status of course relative to degree or certificate program:	Applies to the MS program in Arctic Engineering
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing in Arctic Engineering with a completion of minimum of 9 graduate Arctic Engineering credits.

III. Course Activities

A. Weekly work includes conducting literature review, designing experiments (if applicable), describing methodology (if applicable), conducting experiments or conducting modeling (if applicable), analyzing results, formulating conclusions, providing recommendations for future research and implementation.
B. Student project proposal that is reviewed by the graduate advisory committee.
C. Student project report that is reviewed by the graduate advisory committee.
D. Student project report with incorporated edits/comments from the graduate advisory committee.

IV. Evaluation

Evaluation procedures are at the discretion of the instructor and will be disclosed during the first class in the semester. Students will be evaluated on project proposal and project report.

V. Course Level Justification

A. The course will involve application of engineering and scientific knowledge and skills typical of graduate engineering students.

B. Students are required to accomplish a project demonstrating their command of the principles and skills introduced in the graduate program (MSAE). Significant responsibility for critical thinking and interpretation of technical information will fall on the student at a level commonly associated with graduate education.

VI. Course Outline

The course will be conducted as individual research, and includes the following items that the student submits to the advisory committee:

A. Project Proposal to be approved by the graduate advisory committee.
B. Project Report to be reviewed by the graduate advisory committee. The report should consist of introduction, literature review, methodology (if applicable), results, conclusions, recommendations, and references.
C. Final Project Report incorporating suggestions and improvements as prescribed by reviewers.

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:
   1. Provide students with understanding of and skills how to create a concise project proposal with a relevant background, problem statement, hypothesis and scope of work.
   2. Provide students with skills to formulate appropriate outlines for reports.
   3. Provide students with understanding of the clarity, accuracy, precision, relevance, depth, breadth, logic, significance and fairness required for engineering research reports.
   4. Prepare students to create professional engineering reports.

B. Student Learning Outcomes. After successful completion of the course, the students will be able to:

Student Learning Outcomes	Assessment Procedures
1. Formulate engineering research proposals.	Project proposal
2. Formulate appropriate research methodology.	Proposal and report
3. Conduct literature reviews and collect information pertinent to the research topics.	Project report
4. Comprehend the clarity, accuracy, precision, relevance, depth, logic, significance and fairness required for engineering research reports.	Project report
5. Author professional engineering reports.	Project report

VIII. Suggested Text: NA

IX. Bibliography and Resources

1. Cold Regions Engineering, *Proceedings*, ASCE, Reston, VA.
2. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.
3. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGraw-Hill, New York, NY.
4. Freitag, D. and McFadden, T. 1997. *Introduction to Cold Regions Engineering*, ASCE Press, Reston, VA. [Classic text].
5. *Journal of Cold Regions Engineering*, ASCE Press, Reston, VA.
6. Smith, D. W. (Editor), 1996. *Cold Regions Utilities Monograph*, 3rd ed., ASCE Press, Reston, VA. [Classic text].

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
CB CBPP	ADBP Division of Business Programs	BA

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
BA	A648	N/A	3	(3+0)

6. Complete Course Title
Business Intelligence and Data Mining
Bus. Intel. & Data Mining
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Automatic Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☒ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2015 To: /9999

12. ☐ Cross Listed with
☐ Stacked with
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Masters of Business Administration	09/05/2014	Minnie Yen
2.		
3.		

Initiator Name (typed): Yonggang Lu Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 9/16/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 9/16/2014

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Covers basic business intelligence and data mining including Data Warehousing and Querying. Applies business intelligence and data mining techniques to marketing campaigns, fraud detection, and terrorism detection. Uses SAS Enterprise Miner to illustrate decision trees, classification algorithms, and other data mining techniques. Students may apply for SAS Data Mining Certification.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
N/A

16b. Co-requisite(s) *(concurrent enrollment required)*
N/A

16c. Automatic Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate Standing and undergraduate statistics course with a minimum grade of C

17. ☒ Mark if course has fees Standard CBPP computer lab fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Change contact hours as this is not a lab course. Update registration restrictions.

Initiator (faculty only) Date
Yonggang Lu
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

COURSE CONTENT GUIDE
UNIVERSITY OF ALASKA ANCHORAGE
COLLEGE OF BUSINESS AND PUBLIC POLICY

I. Date Initiated October 20, 2014

II. Course Information

College/School: College of Business and Public Policy
Department: Business Administration
Program: Master of Business Administration, General Management
Course Title: Business Intelligence and Data Mining
Course Number: BA A648
Credits: 3
Contact Hours: 3 per week x 15 weeks = 45 hours
0 lab hours
6 hours outside of class per week x 15 weeks = 90 hours
Grading Basis: A-F
Course Description: Covers basic business intelligence and data mining including Data Warehousing and Querying. Applies business intelligence and data mining techniques to marketing campaigns, fraud detection, and terrorism detection. Uses SAS Enterprise Miner to illustrate decision trees, classification algorithms, and other data mining techniques. Students may apply for SAS Data Mining Certification.
Course Prerequisites: N/A
Registration Restrictions: Graduate Standing and undergraduate statistics course with a minimum grade of C
Fees: Standard CBPP computer lab fee

III. Course Activities

A. Discussion
B. Case studies
C. Lecture

IV. Course Level Justification

This course requires rigorous data analysis and synthesis of quantitative and logical thinking skills gained at the undergraduate level.

V. Outline

A. Business Decision Modeling
   1. Decision making process
   2. Decision making with uncertainty

B. Business Data Environment
   1. Database and data warehousing
   2. Data reporting and querying
   3. Online analytical processing
   4. Data preprocessing and transformation

C. Introduction to Business Intelligence (BI)
   1. The BI Lifecycle
   2. BI implementation
   3. BI and technology

D. Data Mining Techniques
   1. Unsupervised learning methods
      a. Decision trees
      b. Association rule learning
      c. K-Mean cluster analysis
   2. Supervised learning methods
      a. Classification analysis
      b. Neural network
      c. Regression analysis

VI. Suggested Texts

SAS Publishing. (2007). Applied analytics using SAS® Enterprise Miner™ 6.1. Cary: SAS Press.

Tan, P., Steinbach, M., & Kumar, V. (2005). Introduction to data mining (US ed.). Boston: Addison Wesley.

VII. Bibliography

Cerrito, P. B. (2007). *Introduction to data mining - using SAS Enterprise Miner*. Cary: SAS Press.

Roiger, R., & Geatz, M. (2003). *Data mining - a tutorial based primer* (3rd ed.). Boston: Addison Wesley.

Sarma, K. S. (2007). *Predictive modeling with SAS Enterprise Miner: practical solutions for Business Applications*. Cary: SAS Press.

SAS Publishing. (2006). *Data mining using SAS Enterprise Miner: a case study approach* (2nd ed.). Cary: SAS Press.

SAS Publishing. (2009). *Getting started with SAS Enterprise Miner 6.1*. Cary: SAS Press.

Shmueli, G., Patel, N. R., & Bruce, P. C. (2010). *Data mining for business intelligence: concepts, techniques, and applications in Microsoft Office.* Hoboken: Wiley.

VIII. Instructional Goals and Student Outcomes

A. Instructional Goals. **The instructor will:**
1. Introduce students to business intelligence and data mining
2. Present the role and significance of business intelligence organizations
3. Introduce classical data mining techniques used in business intelligence projects
4. Describe how to use data mining techniques and business intelligence concepts to solve various business decision making problems
5. Demonstrate how to use popular data mining software

B. Student Outcomes. **Students will be able to:**	**Assessment Method**
1. Describe the role of business intelligence in everyday business decision making	Exams and written assignments
2. Explain the BI implement process	Exams and written assignments
3. Explain mechanisms of some popular data mining techniques	Exams and written assignments
4. Apply selected data mining techniques	Case studies and presentations

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Mechanical Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ME	A651	N/A	3	(3+0)

6. Complete Course Title
Aerodynamics
Aerodynamics
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with _____
☒ Stacked with ME A451
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Mechanical Engineering	Courtesy Coordination	10/3/2014	Jennifer Brock
2.			
3.			

Initiator Name (typed): Jifeng Peng Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2014

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Fundamentals of aerodynamics, including boundary layer theories, aerodynamics of lifting flow over airfoils, wings of finite span, and airfoil theory in subsonic, transonic and supersonic flows. Literature review and research on selected aerodynamics topics. Special note: Students who have completed ME A451 may not receive credit for ME A651.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing or instructor permission

17. ☒ Mark if course has fees Standard CoENG Fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Added to satisfy demand for MSME ME electives.

Initiator (faculty only) Date
Jifeng Peng
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved
Dean/Director of School/College Date

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

COURSE CONTENT GUIDE

University of Alaska Anchorage, College of Engineering

ME A651
Aerodynamics

1. Course Starting Date	Fall 2015
2. Course Information	
A. College	College of Engineering (CoEng)
B. Course Prefix	ME
C. Course Number	A651
D. Number of Credits and Contact Hours	
	Number of Credits: 3
	Contact Hours: 3+0
E. Course Title	Aerodynamics
F. Grading Basis	A-F
G. Implementation Date	Fall 2015
H. Course Description	Fundamentals of aerodynamics, including boundary layer theories, aerodynamics of lifting flow over airfoils, wings of finite span, and airfoil theory in subsonic, transonic and supersonic flows. Literature review and research on selected aerodynamics topics. Special note: Students who have completed ME A451 may not receive credit for ME A651.
I. Registration Restriction	Graduate standing or instructor permission
J. Course Fee	Standard CoEng fee
K. Stacked	Yes, with ME A451

3. Course Level Justification

This course introduces topics in aerodynamics for graduate students. Graduate standing or instructor permission required for course registration. The course is designed for students with background in mechanical engineering or aerospace engineering. The course also requires understanding of vector analyses, ordinary and partial differential equations. This 600-level course appropriate for graduate students is stacked with a 400-level course appropriate for senior undergraduate students. Graduate-level students taking this course will be expected to complete extra study, which may include but is not limited to research papers, extra assignments, or extra exam problems.

4. Instructional Goals

The instructor will

1. Present the basic aerodynamics principles of lift on airfoils.
2. Present analytical methods for determining lift, including the Navier-Stokes Equations, boundary layer theory, Kutta-Joukowsky theorem, Biot-Savert Law.
3. Present airfoil theory and finite-wing theory.
4. Present aircraft wing design, flight performance, stability and control.
5. Present examples of transonic and supersonic flows, shock and expansion waves.

5. Student Learning Outcomes and Assessment Methods

Students will be evaluated using a variety of tools at the instructor's discretion which may include but are not limited to those listed below. Graduate students taking this course will be required to complete additional work, which may take the form of extra homework problems, extra exam questions, or a separate exam.

Student Learning Outcomes Upon completion of this course, students will be able to:	**Assessment Method**
1. Demonstrate the understanding of boundary layer theory.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
2. Determine the coefficients of lift and drag on airfoils.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
3. Find exact solutions to simple inviscid, incompressible flows given the governing equations and boundary conditions.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
4. Model the flow fields around aerodynamic bodies.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
5. Formulate and apply appropriate aerodynamic models to predict the forces on aircraft wings.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
6. Perform simple aerodynamic analysis and design.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
7. Understand research articles on	Assignments of literature reviews on

advanced aerodynamics subjects.	selected aerodynamics topics.

6. Topical Course Outline

This course will cover a variety of topics related to aerodynamics, which may include but are not limited to:

1. Basic Aerodynamics
    a. The Fundamental Principles Governing Aerodynamics
    b. Navier-Stokes equations
    c. Boundary layer theory
2. Aerodynamics for Inviscid, Incompressible Flow
    a. Bernoulli's equation
    b. Pitot-tube
    c. Kutta-Joukowsky theorem
3. Airfoils, Wings and other Aerodynamic Shapes
    a. Elements of Airplane Performance
    b. Lift and drag
    c. Classic thin airfoil theory
4. The Aerodynamic Analysis of Incompressible Flow Over Airfoils
    a. Vortex filament
    b. The Biot-Savart law
    c. Prandtl's lifting-line theory
    d. The lifting surface theory
5. Aerodynamic Analysis of Flow Over Finite Wings
    a. Wing-tip vortex
    b. Induced drag
6. Principles of Stability and Control
    a. Aircraft stability
    b. Control
7. Introduction to Inviscid, Compressible Flow
    a. Thermodynamics
    b. Stagnation points
    c. Mach number
8. Introduction to Shock & Expansion Waves

a. Speed of sound
b. Normal shock wave properties
c. Expansion wave properties

9. Literature review and research on selected aerodynamics topics

7. Suggested Text

Anderson J. D. Fundamentals of Aerodynamics, 5th Edition, McGraw Hill, 2010.

8. Bibliography

Anderson J. D. Introduction to Flight, 6th Edition, McGraw Hill, 2008.

Anderson J. D. Modern Compressible Flow with Historical Perspective, 3rd Edition, McGraw Hill, 2003.

Milne-Thomson L. M. Theoretical Aerodynamics, Dover, 2011.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EN SOENGR	No Division Code	Mechanical Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ME	A451	N/A	3	(3+0)

6. Complete Course Title
Aerodynamics
Aerodynamics
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2015 To: 99/9999

12. ☐ Cross Listed with _____ Cross-Listed Coordination
☒ Stacked with ME A651
Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Mechanical Engineering	Courtesy Coordination	10/3/2014	Jennifer Brock
2.			
3.			

Initiator Name (typed): Jifeng Peng Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2014
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2014

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduce the fundamentals of aerodynamics, including boundary layer theories, aerodynamics of lifting flow over airfoils, wings of finite span, and airfoil theory in subsonic, transonic and supersonic flows.

16a. Course Prerequisite(s) *(list prefix and number)*	16b. Test Score(s)	16c. Co-requisite(s) *(concurrent enrollment required)*
(MATH A302, ES A341, and ME A313) with minimium grade of C.		

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16e. Registration Restriction(s) *(non-codable)*

17. ☒ Mark if course has fees Standard CoENG fee

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Added to satisfy demand for BSE ME Advanced Engineering Electives.

Initiator (faculty only) Date
Jifeng Peng
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved
Dean/Director of School/College Date

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

COURSE CONTENT GUIDE

University of Alaska Anchorage, College of Engineering

ME A451
Aerodynamics

1. Course Starting Date	Fall 2015
2. Course Information	
A. College	College of Engineering (CoENG)
B. Course Prefix	ME
C. Course Number	A451
D. Number of Credits and Contact Hours	
	Number of Credits: 3
	Contact Hours: 3+0
E. Course Title	Aerodynamics
F. Grading Basis	A-F
G. Implementation Date	Fall 2015
H. Course Description	Introduce the fundamentals of aerodynamics, including boundary layer theories, aerodynamics of lifting flow over airfoils, wings of finite span, and airfoil theory in subsonic, transonic and supersonic flows.
I. Course Prerequisites	(MATH A302, ES A341, and ME A313) with minimum grade of C.
J. Course Fee	Standard CoENG fee
K. Stacked	Yes, with ME A651

3. Course Level Justification

This course introduces topics in aerodynamics for upper-level undergraduate students. This course builds upon core 300 level engineering and mathematics courses.

4. Instructional Goals

The instructor will

1. Present the basic aerodynamics principles of lift on airfoils.

2. Present analytical methods for determining lift, including the Navier-Stokes Equations, boundary layer theory, Kutta-Joukowsky theorem, Biot-Savert Law.
3. Present airfoil theory and finite-wing theory.
4. Present aircraft wing design, flight performance, stability and control.
5. Present examples of transonic and supersonic flows, shock and expansion waves.

5. Student Learning Outcomes and Assessment Methods

Students will be evaluated using a variety of tools at the instructor's discretion which may include but are not limited to those listed below.

Student Learning Outcomes Upon completion of this course, students will be able to:	**Assessment Method**
1. Demonstrate the understanding of boundary layer theory.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
2. Determine the coefficients of lift and drag on airfoils.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
3. Find exact solutions to simple inviscid, incompressible flows given the governing equations and boundary conditions.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
4. Model the flow fields around aerodynamic bodies.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
5. Formulate and apply appropriate aerodynamic models to predict the forces on aircraft wings.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam
6. Perform simple aerodynamic analysis and design.	Homework assignments, projects, quizzes, midterm exams, in-class presentations, and a final/comprehensive exam

6. Topical Course Outline

This course will cover a variety of topics related to aerodynamics, which may include but are not limited to:

1. Basic Aerodynamics
    a. The Fundamental Principles Governing Aerodynamics

   b. Navier-Stokes equations
   c. Boundary layer theory
2. Aerodynamics for Inviscid, Incompressible Flow
   a. Bernoulli's equation
   b. Pitot-tube
   c. Kutta-Joukowsky theorem
3. Airfoils, Wings and other Aerodynamic Shapes
   a. Elements of Airplane Performance
   b. Lift and drag
   c. Classic thin airfoil theory
4. The Aerodynamic Analysis of Incompressible Flow Over Airfoils
   a. Vortex filament
   b. The Biot-Savart law
   c. Prandtl's lifting-line theory
   d. The lifting surface theory
5. Aerodynamic Analysis of Flow Over Finite Wings
   a. Wing-tip vortex
   b. Induced drag
6. Principles of Stability and Control
   a. Aircraft stability
   b. Control
7. Introduction to Inviscid, Compressible Flow
   a. Thermodynamics
   b. Stagnation points
   c. Mach number
8. Introduction to Shock & Expansion Waves
   a. Speed of sound
   b. Normal shock wave properties
   c. Expansion wave properties

7. Suggested Text

Anderson J. D. Fundamentals of Aerodynamics, 5th Edition, McGraw Hill, 2010.

8. Bibliography

Anderson J. D. Introduction to Flight, 6th Edition, McGraw Hill, 2008.

Anderson J. D. Modern Compressible Flow with Historical Perspective, 3rd Edition, McGraw Hill, 2003.

Milne-Thomson L. M. Theoretical Aerodynamics, Dover, 2011.

Program/Prefix Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Program of Study or Prefix

1a. School or College	1b. Department
EA COE	COE - graduate studies

2. Complete Program Title/Prefix
Doctor of Education in Education, Culture, and Leadership

3. Type of Program

Choose one from the appropriate drop down menu: Undergraduate: or Graduate:
Other: specify type in box 2
Doctoral Program

This program is a Gainful Employment Program: ☐ Yes or ☒ No

4. Type of Action:

PROGRAM	PREFIX
☒ Add	☒ Add
☐ Change	☐ Change
☐ Delete	☐ Inactivate

5. Implementation Date (semester/year)
From: Fall/2015 To: /9999

6a. Coordination with Affected Units Department, School, or College: COE

Initiator Name (typed): Ed McLain Initiator Signed Initials: _____ Date:_____

6b. Coordination Email submitted to Faculty Listserv (uaa-faculty@lists.uaa.alaska.edu) Date: 3/31/14

6c. Coordination with Library Liaison Date: 3/28/14

7. Title and Program Description - Please attach the following:

☒ Cover Memo ☒ Catalog Copy in Word using the track changes function

8. Justification for Action

The Ed.D. in Education, Culture, and Leadership is a professional doctorate. The UAA Ed.D program is a practice-based program intended to prepare future leaders in P-12, higher education, and community-based educational contexts. A focus of this degree program is to prepare leaders who have a greater understanding of and who develop the knowledge and skills necessary to provide leadership and support in the Alaskan context, serving and working with diverse populations, and committed to equity for all students in these environments.

Initiator (faculty only) Date
Ed McLain
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chair Date

☐ Approved
☐ Disapproved
College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved
Dean/Director of School/College Date

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UAA College of Education
University of Alaska Anchorage

COE Professional Studies Building
3211 Providence Dr.
Anchorage, AK 99508
907.786.4872

17 October 2014

To: Arlene Schmuland, chair of Graduate Academic Board
David Yesner, Associate Dean of the Graduate School

From: Hilary Seitz, Associate Dean in College of Education
Ed McLain, COE Faculty Initiator
Tim Jester, COE Faculty Initiator

CC: Heather Ryan, Dean in College of Education

Subject: Catalog Copy for EdD in Education, Culture, and Leadership

The College of Education is submitting the catalog copy, the Program Action Request (PAR), and the Assessment plan for the professional doctorate in education, the EdD in Education, Culture, and Leadership. The catalog copy has been reviewed and revised based on the suggestions of the GAB and registrar's office (see response to the notes below). An assessment plan is also being submitted at this time.

The EdD program has been in development for six – plus years. The courses and programs have been developed and reassessed through several ongoing committees in the college. In addition to rigorous review in the COE, a team of external evaluators (from University of Vermont, Portland State, Arizona State University and Virginia Common Wealth University) have provided feedback about the courses and the program as a whole. Based on this feedback, some of the courses were approved in 2012 and others were approved in 2014. The evaluators made two suggestions that impact the CARs of 2012 courses. One of the suggested changes was to eliminate the EDEN A610 course from the program. Originally, this course was meant to be a prerequisite course for other coursework. Now that this course is gone, we respectfully request the removal of the prerequisite requirement in EDEN A611, 613, 615, 616, and 617. The second change we respectfully submit, is the change of repeat status in box 9 of the CAR. We would like students to be able to repeat EDEN A695 for a maximum of 6 credits.

The College of Education Professional Doctorate in Education, Culture, and Leadership closely supports the mission of the University of Alaska. In the UA Academic Master Plan (Spring 2011-Fall 2015), Goal 4 Objective 2 (page 10) states:

Goal 4: Develop and enhance programs to respond to state needs.
Objective 2: Educate teachers for the PK-12 school system across Alaska.

Activity: Proceed with UAA's development of a professional doctorate in education leadership, with application for approval of this program by the Board of Regents and NWCCU.

The EdD in Education, Culture, and Leadership is supported by the College of Education Graduate Studies and Advanced Certification faculty and Dean Ryan.

The catalog package includes the following:

- Memo
- PAR EDEN Catalog copy
- Catalog copy
- Assessment plan

Appendix 1: responses to the notes provided by Chair Schmuland

Notes for EDEN Program Copy:	Notes – COE Response
EDEN Prefix was approved in April 2011 and was sent to Scheduling and Publications April 18, 2014	Yes
EDEN A600: Approved in Spring 2011 with the title *Engaged Leadership* (3 credits)(Co-Requisite EDEN A610)	Course was updated and approved March 2014 – using new version
EDEN A600: Approved in Spring 2014 under the title *Education, Culture, and Leadership Residency* (4 credits)(no co-requisite) – This course is the one listed in the catalog	yes
EDEN A601: Approved in Spring 2014 with the title Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes (3 cr)(Prerequisite EDEN A600)	yes
EDEN A602: Approved in Spring 2014 with the title *Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes* (3 cr)(Prerequisite EDEN A600 and EDEN A601)	yes
EDEN A610: Approved in Spring 2011 under the title *Leadership and Self-Identity* (3 cr)(EDEN A600) This course is no longer in the Catalog Copy but is listed in the online catalog. This course is a prerequisite for: several courses listed in the current catalog copy	This course is no longer in the program. Can we write a memo removing it as a prereq for EDEN 611, 613, 615, 616, 617, 690, 695, 698? We would like to keep it on the books as a possible elective/cognate offering
EDEN A611: Approved in Spring 2011 under the title *Engaged Leadership: Ethics and Stewardship* (3 cr)(Prerequisites EDEN A600 and EDEN A610)	Yes (remove prereq of 610)

EDEN A612: Approved in Spring 2014 with the title *Indigenous Epistemologies in Alaska* (3 cr)(Prerequisites EDEN A600, EDEN A601, EDEN A602) – this course is now listed as having the title *Indigenous ways of Knowing, Learning and Leading* in the current catalog copy	Yes - use current spring 2014 title and ccg
EDEN A613: Approved in Spring 2011 with the title *Leading Change and Innovation* (3 cr) (Prerequisites EDEN A600 and EDEN A610)	Yes (remove prereq of 610)
EDEN A615: Approved in Spring 2011 with the title *Law, Policy, and Advocacy* (3 cr)(Prerequisites EDEN A600 and EDEN A610)	Yes (remove prereq of 610)
EDEN A616: Approved in Spring 2011 with the title *Building Responsive Organizational Capacity* (3 cr) (Prerequisites EDEN A600 and EDEN A610)	yes(remove prereq of 610)
EDEN A617: Approved in Spring 2011 with the title *Engaging Communities* (3 cr) (Prerequisites EDEN A600 and EDEN A610)	Yes (remove prereq of 610)
EDEN A690: Approved in Spring 2011 with the title *Current Topics in Engaged Leadership* (1-3 cr)(Prerequisites EDEN A600 and EDEN A610)	Yes – this is an elective for a possible cognate req
EDEN A695: Approved in Spring 2011 with the title *Internship in Engaged Leadership* (1-3 cr) (Prerequisites EDEN A600 and EDEN A610) – is now listed as *Mentorship, Leadership, and Advocacy* in the current catalog copy as a 6 credit course	Keep course as is – we will make changes next year if needed. We would like to remove the prereq and repeat status
EDEN A698: Approved in Spring 2011 with the title *Research and Creative Scholarship* (1-12 cr) (Prerequisites EDEN A600 and EDEN A610) – This course has not been sent to Scheduling and Publications	Yes keep title (remove prereq of 610) change/remove note

Proposed Catalog Copy for the Doctor of Education

DOCTOR OF EDUCATION (EdD) in Education, Culture, and Leadership

The EdD in Education, Culture, and Leadership is a professional doctorate. The UAA EdD program is a practice-based program intended to prepare future leaders in P-12, higher education, and community-based educational contexts who can effectively translate research into practice, use data to inform decision-making, influence policy, and organize individuals and groups to collaboratively address challenges. A focus of this degree program is to prepare leaders who have a greater understanding of and who develop the knowledge and skills necessary to provide leadership and support in the Alaskan context, serving and working with diverse populations, and committed to equity for all students in these environments.

The doctoral degree requires completion of 52 credit hours. It is offered in cohort, part-time, and distance education modes and has a residency requirement. The program does not provide State certification or licensure.

STUDENT (Scholar-practitioners**) LEARNING OUTCOMES**

Scholar-Practitioners who complete this program will be able to:

1. Inquire about issues surrounding education, equity and social justice to bring about solutions to complex challenges in practice.

2. Construct and apply knowledge to make positive difference in the lives of individual, families, organizations, and communities.

3. Develop and demonstrate collaboration and communication skills to work with diverse communities and to build partnerships.

4. Analyze context and practice, and use multiple frames to develop meaningful, systemic systems that promote positive change.

5. Integrate both practical and research knowledge linking theory with systemic inquiry.

6. Emphasize transformation and use of professional knowledge and practice.

ADMISSION REQUIREMENTS

The College of Education requirements for admission to the doctoral program include the following:

1. Provide evidence of an earned master's degree, with evidence of successful research and study, or the equivalent from a regionally accredited institution or foreign equivalent.
2. Provide transcripts documenting a minimum grade point average in graduate study of 3.5; transcription of earned Master Degree; and six credits of approved

graduate-level research courses with a minimum GPA of 3.0. (The six credits in research will often be part of the candidate's Masters degree program.)
3. Submit professional resume documenting appropriate preparation and experience pertinent to educational and/or organizational leadership and potential to benefit from the program.
4. Submit two professional letters of reference attesting to the leadership ability and scholarship of the applicant.
5. Submit a goal statement that reflects on career goals and how they relate to the EdD.
6. Meet all applicable admission requirements for graduate study as established by UAA and the UAA Graduate School.
7. Successfully pass an interview by a College of Education graduate admission committee (if requested by the Admission Committee).

ACADEMIC PROGRESS

1. All doctoral course work must be completed with a minimum cumulative GPA of 3.0. No more than two courses may be completed with a grade of C. Candidates must successfully complete all program course work prior to enrollment in the Scholarship courses - Research and Creative Scholarship (EDEN A698), and Internship in Engaged Leadership (EDEN A695).

GRADUATION REQUIREMENTS

See the beginning of this chapter for University Requirements for Doctoral Degrees.

PROGRAM REQUIREMENTS

This program includes courses delivered by distance technology. Admitted students must have the technological knowledge and skills to engage in distance learning. An initial intensive summer residency is required as the entry point and grounding experience for all members of the EdD program.

2. **Initial Program Residency-Intensive** (4 credits)
   EDEN A600 Education, Culture, and Leadership Residency 4

3. **Inquiry-Based Scholarship Foundation** (9 credits)

STAT A601	Statistical Methods	3
EDEN A601	Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes I	3
EDEN A602	Inquiry-Based Scholarship: Quantitative, Qualitative, Mixed-modes II	3

4. **Education, Culture, and Leadership Core** (18 credits)

EDEN A611	Engaged Leadership: Ethics and Stewardship	3
EDEN A612	Indigenous Epistemologies in Alaska	3
EDEN A613	Leading Change & Innovation (transformation and innovation)	3
EDEN A615	Law, Policy, and Advocacy	3
EDEN A616	Building Responsive Organizational Capacity	3
EDEN A617	Engaging Communities	3

5. **Focused Inquiry**
   Cognate in the candidate's field of engagement and study by advisement. (9 credits)

6. **Final Scholarship** (12 credits)
   EDEN A695 Internship in Engaged Leadership 6
   EDEN A698 Research and Creative Scholarship 6

7. **Developmental Portfolio**
   The organizing tool for the formative assessments used in the EdD program. The Developmental Portfolio is constructed and maintained by the student on an ongoing basis through the duration of the student's engagement in the program. The portfolio consists of sample documents, reports, and reflections drawn from the student's ongoing course and program work. It is reviewed and discussed by the student and the student's advisor on a regular schedule as directed by the advisor.

8. **Professional (summative) Portfolio**
   The Portfolio is constructed by each student in the program serve as the organizing tool for the summative or culminating assessment of the student's work in the program. The Professional Portfolio consists of examples selected by the student to document the student's refined mastery of target knowledge/skills set and provide examples of the student's academic and professional practice that reflect the students mastery and application of those target proficiencies within the student's academic and professional context or setting. These artifacts, examples of a student's best work and writing are coupled with reflective commentary by the student and the student's advisor and other appropriate contributors familiar with the student's doctoral academic and professional contributions and accomplishments. It is expected that the student's Dissertation in Practice (DiP) and the defense of that dissertation will form an integral component of the Professional Portfolio.

9. **Dissertation in Practice**

   The culminating experience of the doctoral program is the preparation, public presentation, and defense of the candidate's "Dissertation in Practice".

   As the culminating experience that demonstrates the scholarly practitioner's ability to solve problems of practice, the Dissertation in Practice exhibits the doctoral candidate's ability "to think, to perform, and to act with integrity" (Shulman, 2005).

   The dissertation in practice has the traditional five chapters. In this program, the dissertation in practice will focus on a problem of practice that;

   1. Is understood through the lens of culturally responsive practices;
   2. Is defined by a 'process of systematic and intentional inquiry;
   3. Is informed by a critical review of school academic and community data and perspective.

10. **Total credits for degree**: (52 credits)