Agenda

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

#### I. Roll Call

() Arlene Schmuland() Anthony Paris() Peter Olsson() I() Cindy Knall() Dennis Drinka() Clayton Trotter() S() Jervette Ward() FS at Large() FS at Large() I() FS CAS() FS at Large() T() I

() Hsing-Wen Hu
() Sam Thiru
() FS at Large

**Ex-Officio Members** 

() David Yesner() Lora Volden

() 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

- Chg ANTH A615 Advanced Applied Anthropology (stacked with ANTH A415) (3 cr)(3+0)(pg. 4-13)
- Add ANTH A654 Advanced Culture and Ecology (stacked with ANTH A454)(3 cr)(3+0)(pg. 14-29)
- Chg AE A603 Arctic Engineering (stacked with AE A403)(3 cr)(3+0)(pg. 30-37)

#### 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)
Chg	AE A689	Cold Regions Pavement Design (3 cr)(3+0)(pg. 62-65)
Chg	BIOL A662	Advanced Virology (Stacked with BIOL A462)(3 cr)(3+0)(pg. 66-77)

- 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.

Summary

## September 26, 2014 ADM 204 9:30 to 11:30

#### I. Roll Call

(x) Arlene Schmuland(x) Anthony Paris(x) Peter Olsson(x) Hsing-Wen Hu(x) Cindy Knall(x) Dennis Drinka(x) Clayton Trotter(x) Sam Thiru(e) Jervette Ward() FS at Large() FS at Large() FS at Large() FS CAS

**Ex-Officio Members** 

(x) David Yesner
() Lora Volden
(x) Scheduling and Publications

- II. Approval of Agenda (pg. 1-2) Approved
- **III.** Approval of Meeting Summary (pg. 3-4) Approved

#### IV. Administrative Reports

- A. Associate Dean of the Graduate School David Yesner (pg. 5)
- B. Graduate Student
- C. University Registrar Lora Volden

#### D. GAB Chair Arlene Schmuland

Encouraged members to refer to their calendars and confirm if moving the January 9<sup>th</sup> and 23<sup>rd</sup> meetings to January 16<sup>th</sup> and 30<sup>th</sup> to accommodate the Provost Search Committee on January 9<sup>th</sup> and Faculty Senate Spring Forum on January 23<sup>rd</sup>. Update on the CIM Curriculum Workflow and a request for feedback. Question to the board on what the committee should be doing in order to evaluate and update the Curriculum Handbook.

#### V. Program/Course Action Request - First Readings

- 0		1			
Add	STAT A602	Advanced Scientific Sampling (stacked with STAT A402)(3 cr)(3+0)(pg. 6-12)			
Add	STAT A603	Advanced Regression Analysis (stacked with STAT A403)(3 cr)(3+0)(pg. 13-18)			
Add	STAT A604	Advanced Analysis of Variance (stacked with STAT A404)(3 cr)(3+0)(pg. 19-24)			
Add	STAT A607	Advanced Time Series Analysis (stacked with STAT A407)(3 cr)(3+0)(pg. 25-32)			
Add	STAT A608	Advanced Multivariate Statistics (stacked with STAT A408)(3 cr)(3+0)(pg. 33-40)			
All STAT courses are waive first, approve for second					

Chg		Master of Arts, Anthropology (pg. 41-49)
	~	

Waive first, approve for second

Chg	ANTH A615	Advanced Applied Anthropology (stacked with ANTH A415)
		(3 cr)(3+0)(pg. 50-59)

Accepted for first reading

Add ANTH A654 Advanced Culture and Ecology (stacked with ANTH A454)(3 cr)(3+0)(pg. 60-76) **Accepted for first reading** 

Add	ANTH A664	Advanced Culture and Globalization (stacked with ANTH A464)
		(3 cr)(3+0)(pg. 77-93)
Dlt	ANTH A683	Zooarchaeology (stacked with ANTH A483)(4 cr)(3+2)(pg. 94-95)
Dlt	ANTH A685	Advanced Human Osteology (stacked with ANTH A485)(4 cr)(3+2)(pg. 96-97)
Dlt	ANTH A686	Advanced Applied Human Osteology (stacked with ANTH A486)
		(3 cr)(3+0)(pg. 98-99)

#### ANTH A664-A686 are waive first, approve for second

Chg Master of Science, Arctic Engineering (pg. 100-105) Waive first, approve for second AddPrefix, Arctic Engineering (pg. 106-107)Waive first, approve for second

Chg AE A603 Arctic Engineering (stacked with AE A403)(3 cr)(3+0)(pg. 108-115) Accepted for first reading

# All AE courses are postponed until October 10<sup>th</sup> meeting

	1 1	ioned until October 10 meeting
Chg	AE A681	Frozen Ground Engineering (3 cr)(3+0)(pg. 116-119)
Chg	AE A682	Ice Engineering (3 cr)(3+0)(pg. 120-123)
Chg	AE A683	Arctic Hydrology and Hydraulic Engineering (3 cr)(3+0)(pg. 124-127)
Chg	AE A684	Arctic Utility Distribution (3 cr)(3+0)(pg. 128-131)
Chg	AE A685	Arctic Mass and Heat Transfer (3 cr)(3+0)(pg. 132-135)
Add	AE A686	Arctic Engineering Project (3 cr)(0+9)(pg. 136-139)
Chg	AE A689	Cold Regions Pavement Design (3 cr)(3+0)(pg. 140-143)

#### VI. Old Business

#### VII. New Business

A. Review of Graduate Academic Board Draft Goals (pg. 144) Approved

#### VIII. Informational Items and Adjournment



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

1a. School or College     1b. Division       AS CAS     ASSC		<sup>ion</sup> C Division of Social Science					1c. Department Anthropology		
2. Course Prefix	3. Course Number	4. Previous Course Prefix			& Number 5a. Credits/CEUs			5b. Contact Hours	
ANTH	A615	N/A				3	3	(Lecture + Lab) (3+0)	
6. Complete Course Title Advanced Applied Anthropology									
Abbreviated Title for Transcript (30 character)									
7. Type of Course	Academic		paratory/De	•	ent	Non-cre	edit 🗌 CEU	Professional Development	
8. Type of Action:	Add or 🛛 C	nange or	🗌 De	lete	9. Repeat	Status	No # of Repeats	Max Credits	
If a change, mark approp	Cours	se Number act Hours			10. Gradin	g Basis	s 🛛 A-F 🗆 F	P/NP 🗌 NG	
☐ Title ☐ Grading Basis ☑ Course Descrip ☐ Test Score Pre	otion Cross	at Status -Listed/Stacke e Prerequisite quisites				nentatio Spring	on Date semester/year g/2015 To: F	Fall/9999	
Automatic Rest	trictions Regis	tration Restric ral Education		nt	12. 🗌 Cr	oss Lis	ted with		
	] Major lease specify)				Signature Signature	acked	with ANTH A415	Cross-Listed Coordination	
	es or Programs: List a		-						
	ovided in table. If more the Impacted Program/Course		s, submit a		ate of Coordina			oordinator Contacted	
1. Anthropology MA 2.				10/31	/2013		Paul White		
3.									
Initiator Name (typed)	Initiator Name (typed): Sally Carraher Initiator Signed Initials: Date:								
13b. Coordination Email Date: <u>10/31/2013</u> submitted to Faculty Listserv: ( <u>uaa-faculty@lists.uaa.alaska.edu</u> )					13c. Coord	ination	with Library Liaison	Date: <u>10/31/2013</u>	
14. General Education Requirement Mark appropriate box:       Oral Communication       Written Communication       Quantitative Skills       Humanities         Social Sciences       Natural Sciences       Integrative Capstone									
Evaluate and i Special Note: Stude		thods, and am researd	ch projec	t with	local comm	nunity i	institutions, thereby	s, and for social justice in Alaska. developing leadership, Students.	
	site(s) (list prefix and nui	nber or test	16b. Co	-requis	site(s) (concur	rent enr	ollment required)		
code and score) undertraduate cultu minimum grade of C.	ral anthropology course v	vith a							
16c. Automatic Restri	.,	Level	16d. Registration Restriction(s) <i>(non-codable)</i> Graduate standing						
17. Mark if cours	•	<b>_</b>	18. Mark if course is a selected topic course						
19. Justification for A	<ul> <li>19. Justification for Action</li> <li>Updating course description and classroom approach to keep up with innovative teaching strategies being used for similar courses</li> </ul>								
at other universities. Updating prerequisites to ensure students have taken Cultural Anthropology.									
Initiator (faculty only)			Date				ean/Director of School/Co	ollege Date	
Sally Carraher									
Initiator (TYPE NAME)									
Approved Departm	nent Chair		Date		Disapproved		ndergraduate/Graduate A bard Chair	Academic Date	
			Dale						
Approved College	School Curriculum Com	vittoo Chair	Deta		Approved		rovoct or Dopignos	D-1-	
College	School Curriculum Comn		Date			ou Pl	rovost or Designee	Date	

## UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

- I. Date of initiation: October, 2013
- II. A. College or school: CAS
  - B. Course title: Applied Anthropology
  - C. Course prefix: ANTH
  - D. Course number: A615
  - E. Credits and Contact hours: 3.0 credits, 3+0 contact hours
  - F. Grading: A-F
  - G. Stacking: ANTH A415
  - H. Implementation Date: Spring 2015

I. Course description: Evaluate and integrate theory, methods, and history of applied anthropology in the United States, and for social justice in Alaska. Special Note: Students will conduct a team research project with local community institutions, thereby developing leadership, management skills, and commitments to civic engagement. Additional work is required for Graduate Students.

J. Course prerequisites: Undergraduate cultural anthropology course with a minimum grade of C.

K. Registration restrictions: none

L. Course fee: No

III. Course activities/teaching methods:

Course will be offered every other academic year. Each time course is offered, the instructor will have identified a local client and research project, and the main research focus/question for the class to work on as a team. Students work collaboratively with the client to identify specific research questions, project timeline, project data collection methods (i.e. open or structured interviews, focus groups, questionnaire surveys, oral histories, life histories, archival research), and develop project deliverables for the client (i.e. a final report, a web site, pamphlets, public presentation, community education materials). Through this approach, students learn through personal experience how to actually do applied anthropological research with an emphasis on promoting social justice in Alaska. In addition to providing educational materials about the theory, methods, and history of applied anthropology, the instructor serves as a facilitator and mediator for students and the project client.

IV. Course level justification

This course is designed to fulfill the 600 level course-work requirement of graduate students for the applied track MA, although students in the general anthropology MA track may also take the course. This course requires students to develop commitments to civic engagement by applying anthropological methods and theoretical perspectives to research for a community client. The course structure requires high-level critical and

reflexive thinking, organizational skills, working as part of a team, qualitative and quantitative analysis, and effective written and oral communication skills. As a stacked course with undergraduates at the 400-level, ANTH A615 is designed to develop leadership and management skills as graduate students serve as project managers to guide and oversee undergraduate students in research planning, data collection and analysis, and co-authored writing assignments.

V. Instructional goals and student learning outcomes:

The instructor will perform the following tasks before instruction begins:

- Serve as a project facilitator and a mediator between students the client.
- Identify a client (person, community group, or organization) in the Anchorage/Mat-Su area before the start of the semester, and work with the client to identify the main research topic and people who will be involved in the project (i.e. interviewees).
- Obtain IRB and any other necessary approvals/licenses before the start of the semester, as well as project funding (if needed).
- A. The instructor will:
  - 1. Explain the core concepts, historical developments, methods employed, and major results of applying anthropological theory and method to the understanding and amelioration of sociocultural problems or challenges in Alaska, the US, and worldwide.
  - 2. Identify and discuss the major subfields in applied anthropology, and the kinds of employment available in each related to one's educational achievement and experience.
  - 3. Explain the ethical principles required of applied and practicing anthropologists, proving illustrations of both appropriate and unethical activity in the field.

# B. Student learning outcomes:

Student learning outcome	Assessment measures
1. Explore and synthesize the core concepts, historical developments, methods and results of applying anthropological theory and method to sociocultural problems.	Writing assignments, student research journals, graded notes from class discussion and research project planning
2. Integrate knowledge of the development, activities appropriate to, and notable results of applied anthropology into class research and activities.	Writing assignments, student research journals, graded notes from class discussion and research project planning, completing IRB modules.

3.	Critically reflect on the ethical principles adhered to in this field.	Writing assignments, student research journals, graded notes from class discussion and research project planning
4.	Gain experience and competency in types of methods commonly used in applied anthropology.	Writing assignments, student research journals, and review of student self-evaluations
5.	Gain experience in research design, implementing, and analyzing data with an applied anthropological focus; and in the development and dissemination of research deliverables to a client.	Database and project reports developed for the client, co- authored writing assignments, Writing assignments, student research journals, review of student self-evaluations
6.	Work effectively as part of a team.	Co-author on writing assignments, graded notes from class discussion and research project planning.
7.	Gain experience as project managers to assist the instructor with mentoring undergraduate research and writing; and oversee aspects of project completion.	Performance as mentors to undergraduates and as project managers evaluated based research journal entries and instructor's observations during class activities

- VI. Topical course outline:
  - 1. Introduction and overview; distinction between basic and applied anthropological research
  - 2. History and kinds of applied anthropology, globally, in the US, and with a special emphasis on Alaska
  - 3. Ethics in applied research and practice
  - 4. Method and theory in applied anthropology:
    - a. Ethnography, participant observation, key-informant interviewing, oral and life histories, qualitative analyses
    - b. Focus groups, questionnaire surveys, quantitative analyses
  - 5. Applied anthropological research design and process:
    - a. Identifying core research problem and developing specific research questions to answer the problem
    - b. Time management and troubleshooting
    - c. Project management
    - d. Population sampling techniques
    - e. Designing research instruments (surveys, interviews)
    - f. Storing, organizing, coding, and analyzing data
    - g. Writing research dissemination materials for clients and public audiences

- VII. Suggested texts:
  - Beck, Sam & Carl Maida. 2013. Toward Engaged Anthropology. Berghan Books.

Pelto, Pertti J. 2014. Applied Ethnography. Left Coast Press.

- VIII. Bibliography:
  - A. Classical literature:
    - 1. American Anthropological Association Ethical Guidelines. 1998. <u>http://www.aaanet.org/committees/ethics/ethcode.html</u>.
    - 2. Baer, Hans, Singer, Merrill & Ida Susser. 2003. Medical Anthropology and the World System.
    - Ervin, Alexander M. 2004. Applied Anthropology: Tools and Perspectives for Contemporary Practice, 2<sup>nd</sup> edition. Pearson Publishing.
    - 4. Feldman, Kerry, Langdon, Steven J. & N. Natcher. 2005. Northern Engagement: Alaskan Society and Applied Cultural Anthropology, 1973-2003. *Alaska Journal of Anthropology* 3(1):121-155.
    - 5. Wheeler, Polly & Tom Thorton. 2005. Subsistence Research in Alaska: A Thirty Year Retrospective. *Alaska Journal of Anthropology* 3(91):69-103.
  - B. Recent literature:
    - 1. Benard, Russell H. 2006. Research Methods in Anthropology, 4<sup>th</sup> edition.
    - 2. Denzin, Norman K., Lincoln Yvonna S. & Linda Tuhiwai Smith. 2008. Handbook of Critical and Indigenous Methodologies.
    - 3. Henry, Lisa & Roxanna Manoochehri. 2010. On Becoming an Applied Anthropologist: Collaboration and Clients in the Classroom. *Practicing Anthropology* 32(2):26-30.
    - 4. US Department of Health, Education, and Wealth. 2010. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. <u>http://ohsr.od.nih.gov/guidelines/belmont.html</u>.



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

5			b. Division ASSC Division of Social Science					1c. Department Anthropology
2. Course Prefix	3. Course Number	4. Previo	. Previous Course Prefix			& Number 5a. Credits/CEUs		5b. Contact Hours
ANTH	A415	N/A				:	3	(Lecture + Lab) (3+0)
6. Complete Course T Applied Anthropo	logy	L						
Abbreviated Title for Transcri	pt (30 character)							
7. Type of Course	Academic	Pre	paratory/Deve	elopme	ent	Non-cre	edit 🗌 CEU	Professional Development
		hange or		ete	9. Repeat	Status	No # of Repeats	Max Credits
If a change, mark approp	Cours	se Number act Hours at Status			10. Gradin	g Basis	s 🛛 A-F 🗌 F	P/NP 🗌 NG
Grading Basis	otion 🛛 Cross	s-Listed/Stack se Prerequisit quisites		_			on Date semester/year g/2015 To:	Fall/9999
Automatic Rest	= •	tration Restri	ctions Requirement		12. 🗌 Cr	oss Lis	ted with	
College	Major lease specify)				Signature Sta	acked	with ANTH A615	Cross-Listed Coordination
13a. Impacted Course	-		-					
Please type into fields pro	Impacted Program/Course		es, submit a s		e table. A ten			aska.edu/governance.
1. BA/BS Anthropology 2.	·			10/31/	2013		Paul White	
2.								
Initiator Name (typed): Sally Carraher       Initiator Signed Initials:       Date:								
13b. Coordination Em submitted to Facult	ail Date: <u>10/31/</u> y Listserv: ( <u>uaa-faculty@</u>		<u>ka.edu</u> )		13c. Coord	ination	with Library Liaison	Date: <u>10/31/2013</u>
14. General Educatio Mark a	on Requirement ppropriate box:	=	Dral Communication	tion	Written Co		tion Quantitative Natural Scie	
	y, methods, and hist ents will conduct a te	ory of app am-based	l local rese	arch	project thro	ough e	ngagement with co	nasis on social justice in Alaska. mmunity institutions, thereby ms.
16a. Course Prerequi code and score) ANTH A202, minim		mber or test	16b. Co-r	equisi	ite(s) (concur	rent enr	ollment required)	
16c. Automatic Restri	ction(s)		16d. Registration Restriction(s) (non-codable)					
	Major 🗌 Class	Level						
17. 🗌 Mark if cours	se has fees		18. 🗌 N	1ark if	course is a	selecte	d topic course	
<ol> <li>Justification for Action</li> <li>Updating course description and classroom approach to keep up with innovative teaching strategies being used for similar courses at other universities. Updating prerequisites to ensure students have taken Cultural Anthropology (ANTH A202).</li> </ol>								
Initiator (faculty only)			Date	_		red n	ean/Director of School/C	ollege Date
Sally Carraher Initiator (TYPE NAME)			Dale					onege Date
Approved					Approved	<u> </u>	ndergraduate/Graduate	Academic Date
Disapproved Departm	nent Chair		Date	-	Disapprov		pard Chair	200
Approved					Approved			
Disapproved College	School Curriculum Com	nittee Chair	Date	_	Disapprov	red P	rovost or Designee	Date

## UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

- I. Date of initiation: October, 2013
- II. A. College or school: CAS
  - B. Course title: Applied Anthropology
  - C. Course prefix: ANTH
  - D. Course number: A415
  - E. Credits and Contact hours: 3.0 credits, 3+0 contact hours
  - F. Grading: A-F
  - G. Stacking: ANTH A615
  - H. Implementation Date: Spring 2015

I. Course description: Explores theory, methods, and history of applied anthropology in the United States, with an emphasis on social justice in Alaska. Special Note: Students will conduct a team-based local research project through engagement with community institutions, thereby learning the methods of applying anthropology to solve contemporary sociocultural issues and problems.

J. Course prerequisites: ANTH A202, minimum grade of C.

- K. Registration restrictions: none
- L. Course fee: No
- III. Course activities/teaching methods:

Course will be offered every other academic year. Each time course is offered, the instructor will have identified a local client and research project, and the main research focus/question for the class to work on as a team. Students work collaboratively with the client to identify specific research questions, project timeline, project data collection methods (i.e. open or structured interviews, focus groups, questionnaire surveys, oral histories, life histories, archival research), and develop project deliverables for the client (i.e. a final report, a web site, pamphlets, public presentation, community education materials). Through this approach, students learn through personal experience how to actually do applied anthropological research with an emphasis on promoting social justice in Alaska. In addition to providing educational materials about the theory, methods, and history of applied anthropology, the instructor serves as a facilitator and mediator for students and the project client.

IV. Course level justification

This course is designed to fulfill the requirements of students in their upperdivision course-work for the major, building from analysis, writing, literature review, and presentations skills gained in Tier I and II GER courses. Particularly, this course requires students to develop commitments to civic engagement by applying anthropological methodologies and theoretical perspectives through conducting real research for a community client. The structure of this course requires high-level critical and reflexive thinking, organizational skills, working as part of a team, qualitative and quantitative analysis, and effective written and oral communication skills.

- V. Instructional goals and student learning outcomes:
  - A. The instructor will:
    - 1. Explain the core concepts, historical developments, methods employed, and major results of applying anthropological theory and method to the understanding and amelioration of sociocultural problems or challenges in Alaska, the US, and worldwide.
    - 2. Identify and discuss the major subfields in applied anthropology, and the kinds of employment available in each related to one's educational achievement and experience.
    - 3. Explain the ethical principles required of applied and practicing anthropologists, proving illustrations of both appropriate and unethical activity in the field.
    - 4. Serve as a project facilitator and a mediator between students and the client.
    - 5. Identify a client (person, community group, or organization) in the Anchorage/Mat-Su area before the start of the semester, and work with the client to identify the main research topic and people who will be involved in the project (i.e. interviewees).
    - 6. Obtain IRB and any other necessary approvals/licenses before the start of the semester, as well as project funding (if needed).
    - B. Student learning outcomes: The student will

Stu	udent learning outcome	Assessment measures
1.	Explore and synthesize the core concepts, historical developments, methods and results of applying anthropological theory and method to sociocultural problems.	Writing assignments, student research journals, graded notes from class discussion and research project planning
2.	Integrate knowledge of the development, activities appropriate to, and notable results of applied anthropology into class research and activities.	Writing assignments, student research journals, graded notes from class discussion and research project planning
3.	Critically reflect on the ethical principles adhered to in this field.	Writing assignments, student research journals, graded notes from class discussion and research project planning
4.	Gain experience and competency in types of	Writing assignments, student research journals, and review of

	methods commonly used in applied anthropology.	student self-evaluations
5.	Gain experience in designing, carrying out, and analyzing anthropological research with an applied focus; and in the development and dissemination of research deliverables to a client.	Writing assignments, student research journals, review of student self-evaluations
6.	Work effectively as part of a team.	Co-authored writing assignments, graded notes from class discussion and research project planning, and review of student self-evaluations

- VI. Topical course outline:
  - 1. Introduction and overview; distinction between basic and applied anthropological research
  - 2. History and kinds of applied anthropology, globally, in the US, and with a special emphasis on Alaska
  - 3. Ethics in applied research and practice
  - 4. Method and theory in applied anthropology:
    - a. Ethnography, participant observation, key-informant interviewing, oral and life histories, qualitative analyses
    - b. Focus groups, questionnaire surveys, quantitative analyses
  - 5. Research design and process:
    - a. Identifying core research problem and developing specific research questions to answer the problem
    - b. Time management and troubleshooting
    - c. Population sampling techniques
    - d. Designing research instruments (surveys, interviews)
    - e. Storing, organizing, coding, and analyzing data
    - f. Writing research dissemination materials for clients and public audiences
- VII. Suggested texts:

Beck, Sam & Carl Maida. 2013. Toward Engaged Anthropology. Berghan Books.

Pelto, Pertti J. 2014. Applied Ethnography. Left Coast Press.

- VIII. Bibliography:
  - A. Classical literature:
    - 1. American Anthropological Association Ethical Guidelines. 1998. <u>http://www.aaanet.org/committees/ethics/ethcode.html</u>.
    - 2. Baer, Hans, Singer, Merrill & Ida Susser. 2003. Medical Anthropology and the World System.

- 3. Ervin, Alexander M. 2004. Applied Anthropology: Tools and Perspectives for Contemporary Practice, 2<sup>nd</sup> edition. Pearson Publishing.
- 4. Feldman, Kerry, Langdon, Steven J. & N. Natcher. 2005. Northern Engagement: Alaskan Society and Applied Cultural Anthropology, 1973-2003. *Alaska Journal of Anthropology* 3(1):121-155.
- Wheeler, Polly & Tom Thorton. 2005. Subsistence Research in Alaska: A Thirty Year Retrospective. *Alaska Journal of Anthropology* 3(91)69-103.
- B. Recent literature:
  - 1. Benard, Russell H. 2006. Research Methods in Anthropology, 4<sup>th</sup> edition.
  - 2. Denzin, Norman K., Lincoln Yvonna S. & Linda Tuhiwai Smith. 2008. Handbook of Critical and Indigenous Methodologies.
  - 3. Henry, Lisa & Roxanna Manoochehri. 2010. On Becoming an Applied Anthropologist: Collaboration and Clients in the Classroom. *Practicing Anthropology* 32(2):26-30.
  - US Department of Health, Education, and Wealth. 2010. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. <u>http://ohsr.od.nih.gov/guidelines/belmont.html</u>.



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

1a. School or College AS CAS	9	1b. Division ASSC Divisior	n of Social Sc	ence		1c. Department Anthropology	
2. Course Prefix	3. Course Number	4. Previous Course	Prefix & Numb	r 5a.	Credits/CEUs	5b. Contact Hours	
ANTH	A654	N/A		:	3	(Lecture + Lab) (3+0)	
6. Complete Course T Advanced Culture	e and Ecology						
	Abbreviated Title for Transcript (30 character)						
7. Type of Course	7. Type of Course Academic Preparatory/Development Non-credit CEU Professional Development						
		hange or 🗌 De	lete 9. Re	eat Status	No # of Repeate	s Max Credits	
If a change, mark approp Prefix Credits	Cours	se Number act Hours	10. Gr	ding Basi	s 🛛 A-F 🗆	P/NP 🗌 NG	
Title     Grading Basis     Course Descrip     Test Score Pre	Dition Difference Cross	at Status s-Listed/Stacked se Prerequisites		lementation m: Spring	on Date semester/year g/2015 To:	Fall/9999	
Other Restrictio	ons Regis	quisites tration Restrictions ral Education Requireme	nt 12.	Cross Listed with			
	] Major blease specify)		Signature	Stacked	with ANTH A454	Cross-Listed Coordination	
	es or Programs: List a		•				
	ovided in table. If more the		· · · · · · · · · · · · · · · · · · ·				
1. Anthropology MA	Impacted Program/Course	9	10/20/2013	ate of Coordination         Chair/Coordinator Contacted           D/2013         Paul White			
2.							
Initiator Name (typed)	: <u>Diane K. Hanson</u>	Initiator Signed Initials: _	I		Date:		
13b. Coordination Em			13c. C	13c. Coordination with Library Liaison Date: <u>10/31/2013</u>			
submitted to Facult	y Listserv: ( <u>uaa-faculty@l</u>	<u>ists.uaa.alaska.edu</u> )					
14. General Education Mark a	on Requirement	Oral Communio	=	n Communica Sciences	ation Quantitativ		
Apply ecologic societies on enviror	15. Course Description (suggested length 20 to 50 words) Apply 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						
code and score)	Undergraduate course in cultural anthropology required						
16c. Other Restriction	n(s)	16d. Re	gistration Restr	ction(s) (n	on-codable)		
College	Graduate standing						
17. 🛛 Mark if cours	se has fees	18.	Mark if course	a selecte	ed 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.

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

#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

I.	Date of Initiation Date:	Fall 2013
П.	Course Information	
B. C. D. E. F. G.	College: Course Prefix Course Number Number of Credits Contact Hours Course Title: Grading Basis: Implementation Date Course Description:	College of Arts and Sciences ANTH A654 3 3+0 Advanced Studies in Culture and Ecology A-F Spring 2015 Apply 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.
K. L.	Status of Course Relative to a Degree or Certificate Program: Course Fees: Registration Restrictions: Stacking	Elective in the MA Anthropology No Graduate Standing 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 Justifications:

A. Justification for new course: this course will provide graduate students with information on human-environmental relationships, including key concepts of resilience and sustainability, as well as traditional ecological knowledge and

indigenous environmental perspectives, that are critical to graduate 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

St	udent 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

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

# VII. Topical Outline:

I. Introduction

- II. 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
- III. 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
- IV. Population & Environment
- V. Development & Urbanization
- VI. 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
- VII. Indigeneity & the Environment
  - a. Traditional Ecological Knowledge
  - b. Indigenousness & Environmentalism
  - c. Indigenous Rights
- VIII. Contemporary Issues in Environmental Anthropology
  - a. Health & Environment
  - b. Climate Change
  - c. Consumption & Globalization

### 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.
- 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.
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- Ellen, R. F., Parkes, P., & Bicker, A. (2000). Indigenous environmental knowledge and its transformations: Critical anthropological perspectives. Amsterdam: Harwood Academic.\*
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- 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: Crossdisciplinary 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.
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- 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 AS CAS	9	1b. Division ASSC Division	n of Social Scien	ce		1c. Department Anthropology	
2. Course Prefix	3. Course Number	4. Previous Course	Prefix & Number	5a. C	Credits/CEUs	5b. Contact Hours (Lecture + Lab)	
ANTH	A454	ANTH A354		3	5	(3+0)	
-	6. Complete Course Title Culture and Ecology						
7. Type of Course	Academic	Preparatory/De		Non-cre	dit 🗌 CEU	Professional Development	
7. Type of Course		Preparatory/De		Non-cre			
8. Type of Action: [		hange or 🗌 De	lete 9. Repea	t Status	No # of Repeats	Max Credits	
Prefix Credits	Cours	se Number act Hours	10. Gradir	ng Basis	🖾 A-F 🗌 F	P/NP 🗌 NG	
Title Grading Basis Course Descrip Test Score Pre	ption X Cross	at Status -Listed/Stacked se Prerequisites quisites		nentatio Spring	n Date semester/year /2015 To:	Fall1/9999	
Other Restriction	ons Regis	tration Restrictions ral Education Requireme	nt 12. 🗌 C	ross List	ed with		
Other CCG (pl			Signature St				
	es or Programs: List a ovided in table. If more the		•	•			
	Impacted Program/Course		Date of Coordina			Coordinator Contacted	
	e (Tier 3 GER), p. 87 2012				Faculty List Serv		
3.	ciety BA/BS, p. 106, 2012	-13 catalog	10/31/2013		Dorn Van Dommelen		
Initiator Name (typed)	: <u>Diane K. Hanson</u>	Initiator Signed Initials: _			Date:		
13b. Coordination Em submitted to Facult	ail Date: <u>10/31/</u> ty Listserv: ( <u>uaa-faculty@</u> l		13c. Coord	dination	with Library Liaison	Date: 10/31/2013	
14. General Education		Oral Communio	cation 🗌 Written C	ommunica	tion Quantitative	Skills Humanities	
Mark a	appropriate box:	Fine Arts	Social Sc	ences	Natural Scie	nces 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.							
code and score)	16a. Course Prerequisite(s) (list prefix and number or test code and score) ANTH A202 minimum grade of C						
16c. Other Restriction	16c. Other Restriction(s) 16d. Registration Restriction(s) (non-codable)						
College Major Class Level							
17. 🗌 Mark if cours	se has fees	18. 🗌	Mark if course is a	selecte	d topic course		
<ol> <li>Justification for Action</li> <li>This capstone course has been taught at the advanced undergraduate level for the past several years, and its movement to the</li> <li>400 level reflects its content level as a capstone course in Anthropology.</li> </ol>							

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

## UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

Fall 2013

Ι.

Date of Initiation Date:

н.	Course Information	
B. C. D. E. F. G.	College: Course Prefix Course Number Number of Credits Contact Hours Course Title: Grading Basis: Implementation Date Course Description:	College of Arts and Sciences ANTH A454 3 3+0 Culture and Ecology A-F Spring 2015 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.
	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
	Course Fees:	No
	Course Prerequisite: Stacking	ANTH A202, minimum grade of C 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 nationstates.

## 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

	udent Learning itcomes:	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	Examinations, student	Critical thinking,		

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

	traditions in anthropology and their approaches to understanding human/environment interactions	journals/reflections from class discussions, graded daily questions	information literacy, knowledge integration
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:

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# VIII. Bibliography:

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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.\*

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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.\*

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

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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.\*\*

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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 EN SOENGR		1b. Divisi No D	on Division Code							artment il Engineering	
2. Course Prefix	3. Course Number	4. Previo	us Course Prefix	& N	umber	5a.	Credits/	CEUs	5b. Co	ntact Hours	
AE	A603	CE A6	503				3			cture + Lab) +0)	
6. Complete Course T Arctic Engineering Arctic Engineering Abbreviated Title for Transcri	itle g						-		(3		
7. Type of Course	Academic	Pre	paratory/Developm	nent		Non-c	credit	CEU	Pro	ofessional Development	
		ange or	Delete	9.	Repeat	Statu	us No	# of Repeats		Max Credits	
If a change, mark approp	Course	e Number ct Hours		10	. Gradin	g Bas	sis D	🛾 A-F 🗌 P	/NP	NG	
☐ Title ☐ Grading Basis ☑ Course Descrip ☐ Test Score Pre	otion Cross-	it Status Listed/Stack e Prerequisit quisites		11	. Implem From:			semester/year To: 99/9	9999		
Other Restrictio		ration Restri	ctions	12	. 🗌 Cro	oss L	isted with	_			
	lease specify)			Sig	nature Sta	acked	d with	AE A403		Cross-Listed Coordinati	ion
	s or Programs: List an		• ·			•					
	ovided in table. If more tha Program/Course		log Page(s) Impact		Date of					linator Contacted	
1. MS of Arctic Enginee	ring	336			1/24/201	4		Hannele Zubec			
2. BS of Engineering, E 3.	E/ME	260, 1	261	_	12/6/201	3		Jeff Hoffman/Je	ens Munk		
Initiator Name (typed):	Hannele Zubeck	nitiator Sign	ed Initials:				Date:				
13b. Coordination Ema		14		130	c. Coord	inatio	on with Li	brary Liaison	Date:	<u>10/3/2014</u>	
14. General Educatio Mark a	on Requirement ppropriate box:	=	Dral Communication		Written Co Social Scie		ication	Quantitative	=	Humanities Integrative Capstone	
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16a. Course Prerequis N/A	site(s) (list prefix and num	nber)	16b. Test Sco N/A	re(s)				Co-requisite(s) N/A	(concurren	t enrollment required)	
16d. Other Restriction	(s)		16e. Registrat	tion Restriction(s) (non-codable)							
		Level									
17. X Mark if cours Engineering Fee	e has fees Standard		18. 🗌 Mark i	f cou	irse is a s	select	ted topic	course			
<ol> <li>Justification for Ad For identity and Engineering prefix.</li> </ol>	ction assessment purpos	ses, the ke	ey graduate co	urse	s of the	Arcti	ic Engin	eering progra	am are be	eing given the Arctic	
					Approved						
Initiator (faculty only) Hannele Zubeck Initiator (TYPE NAME)			Date		Disapprov	red	Dean/Dire	ctor of School/Co	ollege		Date
Approved					Approved	_	Undergrad	huato/Graduata /	Andomio		Data
Disapproved Departr	ment Chairperson		Date		Disapprov		Undergrad Board Cha	duate/Graduate A airperson	vcauemic		Date
Approved					Approved	-					
Disapproved Curricu	lum Committee Chairperso	on	Date		Disapprov	ed	Provost or	Designee			Date

### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

February 20, 2014

_,			1 <b>Contract J D O J D D D D D D D D D D</b>
II.	Cour	se Information	
	A.	College:	College of Engineering
	В.	Course Title:	Arctic Engineering
	C.	Course Subject/Number:	AE A603
	D.	Credit Hours:	3.0
	E.	Contact:	3+0
	F.	Grading Information:	A-F
	G.	Course Description:	Introduces students to a broad spectrum of engineering challenges unique to cold regions. Discusses physical principles and practical data collection methods, analyses, designs, and construction methods. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study. Students must submit a research paper. Special note: Graduate standing with a baccalaureate degree in engineering. No previous credit for CE/AE A403.
	H.	Status of course relative to d	legree or certificate program: Applies to the MS program in Arctic Engineering, and BS program in Engineering, with Mechanical and Electrical concentrations.
	I.	Lab Fees:	Standard Engineering Fee
	J.	Coordination:	UAA/CoEng/CE faculty list serves
	K.	Course Prerequisites:	NA
	L.	Registration Restrictions:	NA

### **III.** Course Activities

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

# IV. Evaluation

I.

**Initiation Date:** 

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 Outline

- Global Perspectives and Climate Change
- Units of Measure and Heat Transfer
- Ice Engineering
- Snow Engineering
- Frozen Ground Engineering
- Arctic Roads
- Arctic Buildings
- Arctic Utilities
- Arctic Construction
- Mechanical and Electrical Engineering Issues in Cold Regions
- Winter Safety and Survival
- Presenting research results

# VII. Instructional Goals and Student Learning Outcomes

- A. Instructional Goals. The instructor will
  - 1. Introduce the students to a variety of Arctic Engineering issues and prepare them for further study in each topic in the course outline.
  - 2. Provide students with understanding and skills to evaluate the effects of ice, snow and freezing temperatures on the design and construction of arctic buildings and infrastructure.
  - 3. Provide students with understanding and skills to include climate variation conditions in arctic design.
  - 4. Provide students with understanding and skills to calculate basic heat transfer and moisture migration in buildings.
  - 5. 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.	Include climate variation considerations in arctic	Homework assignments, exams and
	designs.	term paper.
2.	Conduct basic heat transfer calculations with an ability	Homework assignments, exams and
	to convert units of measure.	term paper.
3.	Evaluate the effects of ice and snow on arctic	Homework assignments, exams and
	infrastructure.	term paper.
4.	Evaluate the effects of ground freezing on foundations	Homework assignments, exams and
	and roads.	term paper.
5.	Evaluate the effects of freezing air temperatures and	Homework assignments, exams and
	snow on building design.	term paper.
6.	Avoid design failures of arctic utilities due to arctic	Homework assignments, exams and
	conditions.	term paper.

7.	Evaluate the effects of arctic conditions on	Homework assignments, exams and
	construction, winter safety and survival.	term paper.
8.	Use psychrometric chart and calculate moisture	Homework assignments, exams and
	migration in structures.	term paper.
9.	Evaluate the effects of arctic conditions to electrical	Homework assignments, exams and
	engineering projects.	term paper.
10	. Author papers that are professional quality	Term paper.

# VIII. Suggested Text

No suggested text. References are drawn from the professional literature and equivalent online sources of technical information, such as data from the NOAA's National Climatic Data Center and manuals from the ERDC/CRREL USA Corps of Engineers (e.g. 2002. *Engineering and Design: Ice Engineering*. U.S. Army Corps of Engineers Engineer Manual 1110-2-1612.)

# IX. Bibliography and Resources

- 1. AIA Alaska, 2004. *Northern Building Design*, American Institute of Architects, Anchorage, AK.
- 2. Andersland, O. and Ladanyi, B., 2004. *Frozen Ground Engineering*, 2<sup>nd</sup> Ed., ASCE Press, Reston, VA.
- 3. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.
- 4. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGraw-Hill, New York, NY.
- 5. Freitag, D. and McFadden, T., 1997. *Introduction to Cold Regions Engineering*, ASCE Press, Reston, VA. [Classic text].
- 6. Journal of Cold Regions Engineering, ASCE Press, Reston, VA.
- 7. Smith, D. (Editor), 1996. *Cold Regions Utilities Monograph*, 3rd Ed., ASCE Press, Reston, VA. [Classic text].
- 8. Rice, E., 1996. *Building in the North*, University of Alaska, Fairbanks, AK. [Classic text].



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

1a. School or College EN SOENGR	1b. Division No Division Code						1c. Department Civil Engineering			
2. Course Prefix	3. Course Number	4. Previo	us Course Prefix	& Number 5a. Credits/CEUs				intact Hours		
AE	A403	CE A4		3				ecture + Lab) +0)		
6. Complete Course Title Arctic Engineering Abreviated Title for Transcript (30 character)										
7. Type of Course	Academic	Pre	paratory/Developm	ent	] Non-o	credit	CEU	🗌 Pi	ofessional Development	
8. Type of Action: Add or Change or Delete					9. Repeat Status No # of Repeats Max Credits					
Prefix Credits					10. Grading Basis 🛛 A-F 🗌 P/NP 🗌 NG					
Title     Repeat Status       Grading Basis     Cross-Listed/Stacked       Course Description     Course Prerequisites				11. Implementation Date semester/year From: Spring/2015 To: 99/9999						
Other Restrictio	Class Level			12. Cross Listed with						
	ease specify)			Signature	Stacked	d with	AE A603		Cross-Listed Coordina	tion
13a. Impacted Course	0		0 1		•					
Please type into fields pro			· ·		· ·				overnance. dinator Contacted	
1. BS of Civil Engineeri	Program/Course	254	llog Page(s) Impact	1/24/2		dination	Osama Abaza	Jnaii/Coor		
2. BS of Construction N		223		2/4/20			Jeffrey Callaha			
3. BS of Engineering, E		260,		12/6/2	)13		Jens Munk/Jeff	Hoffman		
Initiator Name (typed):	Hannele Zubeck	Initiator Sign	ed Initials:			Date:_				
13b. Coordination Email       Date: 2/4/2014       13c. Coordination with Library Liaison       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 Educatio Mark a	n Requirement	=	Dral Communication	=	Communi ciences	ication	Quantitative Natural Scier	Ē	Humanities Integrative Capstone	
15. Course Description (suggested length 20 to 50 words) Introduces students to a broad spectrum of engineering challenges unique to cold regions. Discusses physical principles and practical data collection methods, analyses, designs, and construction methods. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.										
			16b. Test Sco N/A	core(s) 16c. Co-requisite(s) (concurrent enrollment required) N/A						
				ion Restriction(s) <i>(non-codable)</i> r senior standing in an accredited undergraduate program in engineering or anagement.						
17. Mark if course has fees Standard 18. Mark if course is Engineering fee					a selec	ted topic	course			
<ol> <li>Justification for Action</li> <li>For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.</li> </ol>										
				Approv	ed					
Initiator (faculty only) Hannele Zubeck Initiator (TYPE NAME)			Date	Disapp	roved	Dean/Dire	ctor of School/Co	ollege		Date
					ed -					
										Data
	nent Chairperson		Date	Disapp		Undergrad Board Cha	luate/Graduate A airperson	Academic		Date
Approved	nent Chairperson		Date		oved			Academic		Date

### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

Initi	ation Date:	February 20, 2014					
Cou	Course Information						
А.	College:	College of Engineering					
В.	Course Title:	Arctic Engineering					
C.	Course Subject/Number:	AE A403					
D.	Credit Hours:	3.0					
E.	Contact:	3+0					
F.	Grading Information:	A-F					
G.	Course Description:	Introduces students to a broad spectrum of engineering challenges unique to cold regions. Discusses physical principles and practical data collection methods, analyses, designs, and construction methods. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.					
H.	Status of course relative to	F course relative to degree or certificate program: Applies to the BS programs in Civil Engineering, Engineering with Mechanical and Electrical Engineering concentrations, and Construction Management.					
I.	Lab Fees:	Standard Engineering Fee					
J.	Coordination:	UAA/CoEng/CE faculty list serves					
К.	Course Prerequisites:	NA					
L.	Registration Restrictions:	Junior or senior standing in an accredited undergraduate program in engineering or construction management.					

### III. Course Activities

Faculty presentations, homework assignments, exams and class discussions.

# IV. Evaluation

I.

II.

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 and exams.

# 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 of upper class standing in engineering or construction management programs.

## VI. Course Outline

- Global Perspectives and Climate Change
- Units of Measure and Heat Transfer
- Ice Engineering
- Snow Engineering
- Frozen Ground Engineering
- Arctic Roads
- Arctic Buildings
- Arctic Utilities
- Arctic Construction
- Mechanical and Electrical Engineering Issues in Cold Regions
- Winter Safety and Survival

### VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

- 1. Introduce the students to a variety of Arctic Engineering issues and prepare them for further study in each topic in the course outline.
- 2. Provide students with understanding and skills to evaluate the effects of ice, snow and freezing temperatures on the design and construction of arctic buildings and infrastructure.
- 3. Provide students with understanding and skills to include climate variation conditions in arctic design.
- 4. Provide students with understanding and skills to calculate basic heat transfer and moisture migration in buildings.

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

	win be able to:	
	Student Learning Outcomes	Assessment Procedures
1.	Include climate variation considerations in arctic	Homework assignments and exams
	designs.	
2.	Conduct basic heat transfer calculations with an ability	Homework assignments and exams
	to convert units of measure.	
3.	Evaluate the effects of ice and snow on arctic	Homework assignments and exams
	infrastructure.	
4.	Evaluate the effects of ground freezing on foundations	Homework assignments and exams
	and roads.	
5.	Evaluate the effects of freezing air temperatures and	Homework assignments and exams
	snow on building design.	
6.	Avoid design failures of arctic utilities due to arctic	Homework assignments and exams
	conditions.	
7.	Evaluate the effects of arctic conditions on	Homework assignments and exams
	construction, winter safety and survival.	_
8.	Use psychrometric chart and calculate moisture	Homework assignments and exams
	migration in structures.	_
9.	Evaluate the effects of arctic conditions on electrical	Homework assignments and exams
	engineering projects.	_
		·

# VIII. Suggested Text

No suggested text. References are drawn from the professional literature and equivalent online sources of technical information, such as data from the NOAA's National Climatic Data Center and manuals from the ERDC/CRREL USA Corps of Engineers (e.g. 2002. *Engineering and Design: Ice Engineering*. U.S. Army Corps of Engineers Engineer Manual 1110-2-1612.)

- 1. AIA Alaska, 2004. *Northern Building Design*, American Institute of Architects, Anchorage, AK.
- 2. Andersland, O. and Ladanyi, B., 2004. *Frozen Ground Engineering*, 2<sup>nd</sup> Ed., ASCE Press, Reston, VA.
- 3. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.
- 4. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGraw-Hill, New York, NY.
- 5. Freitag, D. and McFadden, T., 1997. *Introduction to Cold Regions Engineering*, ASCE Press, Reston, VA. [Classic text].
- 6. Journal of Cold Regions Engineering, ASCE Press, Reston, VA.
- 7. Rice, E., 1996. Building in the North, University of Alaska, Fairbanks, Alaska. [Classic text].
- 8. Smith, D., Editor, 1996. *Cold Regions Utilities Monograph*, 3rd Ed., ASCE Press, Reston, VA. [Classic text]



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2. Course Prefix	3. Course Number	4. Previou	us Course Prefix	& Number	5a. Credi	ts/CEUs	5b. Contact Hours	
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6. Complete Course T Frozen Ground E Frozen Ground Eng Abbreviated Title for Transcri	ngineering jineering							
7. Type of Course	Academic	Pre	paratory/Developm	ent	Non-credit	CEU	Professional Development	
		hange or	Delete	9. Repeat	Status No	# of Repeats	Max Credits	
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Other Restrictio	ons Regis	stration Restrie	ctions	12. 🗌 Cr	oss Listed	vith		
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Impacted	Program/Course	Cata	log Page(s) Impact	ed Date of	Coordination		Chair/Coordinator Contacted	
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3.	0							
Initiator Name (typed):	Hannele Zubeck	Initiator Sign	ed Initials:		Dat	e:		
13b. Coordination Email       Date: 2/4/2014       13c. Coordination with Library Liaison       Date: 2/4/2014         submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)       13c. Coordination with Library Liaison       Date: 2/4/2014							D / 0/1/0011	
			ka.edu)	13c. Coord	ination with	LIDIARY LIAISON	Date: <u>2/4/2014</u>	
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#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

# I. Initiation Date: February 20, 2014

#### II. **Course Information** College: College of Engineering Α. Β. Course Title: Frozen Ground Engineering C. Course Subject/Number: AE A681 D. Credit Hours: 3.0 E. 3+0Contact: 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, 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

#### **III.** Course Activities

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

undergraduate program in engineering.

#### 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 Outline

- Introduction to Frozen Ground
- Physical and Thermal Properties of Soils
- Frost Action
- Heat Flow in Soils
- Thaw Behavior of Frozen Ground
- Mechanical Properties of Frozen Soils
- Foundations in Frozen Ground
- Construction Ground Freezing
- Term Paper Conference
- Pavement Design
- Field Investigations and Earthwork
- Presenting research results

#### 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,	Homework assignments, exams,		
	heat flow and frost heave rates in soils.	term paper.		
3.	Analyze thaw weakening of frozen soils and estimate	Homework assignments, exams,		
	thaw settlement.	term paper.		
4.	Determine strength and creep parameters of frozen	Homework assignments, exams,		
	soils.	term paper.		
5.	Prevent foundation/pavement failure due to seasonally	Homework assignments, exams,		
	frozen ground or permafrost.	term paper.		
6.	Identify important issues in earthwork, field	Homework assignments, exams,		
	investigations, and construction ground freezing	term paper.		
	project.			
7.	Author papers acceptable for publication.	Term paper.		

# VIII. Suggested Text

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

- 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.
- 3. Freitag, D. and McFadden, T., 1997. *Introduction to Cold Regions Engineering*, ASCE Press, Reston, VA. [Classic text].
- 4. Journal of Cold Regions Engineering, ASCE Press, Reston, VA.
- 5. Smith, D. (Editor), 1996. *Cold Regions Utilities Monograph*, 3rd Ed., ASCE Press, Reston, VA. [Classic text].



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2. Civil Engineering MS 3.	Program	NA		1/24/2014 Osama Abaza						
Initiator Name (typed)	: Hannele Zubeck	Initiator Sign	ed Initials:	Date:						
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16a. Course Prerequi NA	site(s) (list prefix and nur	nber)	16b. Test Sco N/A	ore(s) 16c. Co-requisite(s) (concurrent enrollment required) N/A						
☐ College ☐ Major ☐ Class ⊠ Level Graduat in an accredite					tion Restriction(s) <i>(non-codable)</i> e standing, with a baccalaureate degree in engineering, or upper class standing ed undergraduate program in engineering, having completed a mechanics of se with a minimum grade of C.					
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#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

I. II.		tion Date: se Information	February 20, 2014
	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. Including 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, ice forces on riverine, and ocean structures.
	H.	Status of course relative to d	egree 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 Outline

- A. Physical Ice Properties and Processes
- B. River, Lake, and Sea Ice
- C. Ice Navigation and Control of Ice in Channels
- D. Structural and Non-structural Ice control Measures
- E. Ice Jam Processes and Classification
- F. Ice Jam Data Collection, Hydraulics, and Mitigation
- G. Bearing Capacity of Floating Ice Sheets
- H. Ice Forces on Structures and Related Processes
- I. Construction of Ice Roads and Bridges
- J. Presenting research results

#### 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	Homework assignments, exams and
efficiency of human endeavors in cold regions.	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.

- 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].



1a. School or College EN SOENGR		1b. Divisi No D	on Division Code								epartment ivil Engineering	
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#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

I.	Initiation Date:		February 20, 2014					
II.	Cours A. B. C. D. E. F. G.	se Information College: Course Title: Course Subject/Number: Credit Hours: Contact Time: Grading Information: Course Description:	College of Engineering Arctic Hydrology and Hydraulic Engineering AE A683 3.0 3+0 A-F 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 de	egree 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	Homework assignments, exams and
	challenges that are unique to rivers and streams in cold	term paper.
	regions.	
2.	Interpret associated specialized language and units of	Homework assignments, exams and
	measure.	term paper.
3.	Locate, interpret, and apply public information about	Homework assignments, exams and
	cold regions hydrology and related physical	term paper.
	conditions.	
4.	Apply physical principles for specialized solutions to	Homework assignments, exams and
	cold regions hydraulic engineering problems,	term paper.
	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.	
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.

- 1. Bedient, P., Huber, W., Vieux, B., 2013. *<u>Hydrology and Floodplain Analysis</u>*, 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. *<u>Runoff from Snowmelt</u>*, EM 1110-2-1406, Washington, DC. [Classic text].



1a. School or College EN SOENGR	)	1b. Divisi No D	on Division Code					1c. Department Civil Engir		
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Initiator Name (typed)	: <u>Hannele Zubeck</u>	Initiator Sign	ed Initials:			Date:_				
13b. Coordination Em submitted to Facult	ail Date: <u>2/4/20</u> y Listserv: ( <u>uaa-faculty@li</u>		ka.edu)	13c. Coordination with Library Liaison   Date: 2/4/2014						
14. General Educatio Mark a	on Requirement ppropriate box:	=	Dral Communication	Written Co		cation	Quantitative	=	ities tive Capstone	
Introduces stud affordable water su	on (suggested length 20 t dents to physical prir pply, fire protection, n rural Arctic Alaska.	nciples and								
16a. Course Prerequi NA	site(s) (list prefix and nur	nber)	16b. Test Sco N/A	ore(s) 16c. Co-requisite(s) (concurrent enrollment required) N/A					ent required)	
upper class sta				e standing, w anding in an a	ith a b iccred	baccalau	reate degree ir	gram in engineeri	hysical science, or ng, having	
17. 🛛 Mark if cours	se has fees SCoEng		18. 🗌 Mark i	f course is a	select	ed topic	course			
<ol> <li>Justification for Action</li> <li>For identity and assessment purposes, the key graduate courses of the Arctic Engineering program are being given the Arctic Engineering prefix.</li> </ol>							en the Arctic			
				Approved						
Initiator (faculty only)			Date	Disapprov	ved [	Dean/Dire	ctor of School/Co	ollege	Date	
Hannele Zubeck Initiator (TYPE NAME)										
_										
Approved Depart	ment Chairperson		Date	Approved	L L	Undergrad Board Cha	duate/Graduate A	cademic	Date	
			Duit							
Approved	lum Committee Chairpers	on	Date	Approved	_	Provostor	Designee		Date	
	ion commutee onanpers		Duit		I	101031 01	Designee		Dale	

#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

February 20, 2014

II.	Cours	se Information	
11.	A.	College:	College of Engineering
	B.	Course Title:	Arctic Utility Distribution
	C.	Course Subject/Number:	AE A684
	С. D.	Credit Hours:	3.0
	Б. Е.	Contact:	3+0
	E. 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 d	egree 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

#### **III.** Course Activities

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

minimum grade of C.

completed a water resources course with a

#### IV. Evaluation

I.

**Initiation Date:** 

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 Outline

- A. Overview of Cold Regions Utilities
- B. Planning and Project Development
- C. Frozen Ground Foundations for Utilities
- D. Thermal Considerations
- E. Water Sources and Development
- F. Water Treatment
- G. Water Storage
- H. Water Distribution
- I. Wastewater Collection, Treatment and Disposal
- J. Presenting research results

## 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 OutcomesAssessment Procedures1. 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 eommon designs for water and wastawaterHomework assignments, exams and term paper.			1
methods and specialized language necessary for solving water and wastewater system design and analysis problems encountered in cold regions.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 andHomework assignments, exams and term paper.		Student Learning Outcomes	Assessment Procedures
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 andHomework assignments, exams and term paper.	1.	Use physical properties, mathematics, analytical	Homework assignments, exams and
analysis problems encountered in cold regions.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 andHomework assignments, exams and term paper.		methods and specialized language necessary for	term paper.
<ol> <li>Identify and summarize governing processes associated with freezing and thawing phenomena.</li> <li>Locate, interpret, and apply public information about cold regions physical conditions and engineering variables.</li> <li>Homework assignments, exams and term paper.</li> <li>Homework assignments, exams and term paper.</li> </ol>		solving water and wastewater system design and	
associated with freezing and thawing phenomena.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 andHomework assignments, exams and		analysis problems encountered in cold regions.	
<ul> <li>3. Locate, interpret, and apply public information about cold regions physical conditions and engineering variables.</li> <li>4. Determine foundation and support conditions and Homework assignments, exams and Homework assignments, exams</li></ul>	2.	Identify and summarize governing processes	Homework assignments, exams and
cold regions physical conditions and engineering variables.term paper.4. Determine foundation and support conditions andHomework assignments, exams and		associated with freezing and thawing phenomena.	term paper.
variables.Image: Constraint of the second secon	3.	Locate, interpret, and apply public information about	Homework assignments, exams and
4. Determine foundation and support conditions and Homework assignments, exams and		cold regions physical conditions and engineering	term paper.
		variables.	
common designs for water and westerwater term paper	4.	Determine foundation and support conditions and	Homework assignments, exams and
common designs for water and wastewater term paper.		common designs for water and wastewater	term paper.
infrastructure, including piles, post and pad, and		infrastructure, including piles, post and pad, and	
frozen foundation designs.		frozen foundation designs.	
5. Author papers acceptable for publication.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].

- 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 Region Engineering, ASCE Press, Reston, VA.
- 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].



1a. School or College EN SOENGR		1b. Divisi No D	<sup>on</sup> Division Code								epartment ivil Engineering	
2. Course Prefix 3	3. Course Number	4. Previo	us Course Prefix	& Nu	umber	5a.	Credits/	/CEUs			ontact Hours	
AE	A685	ME A	685				3				.ecture + Lab) 3+0)	
6. Complete Course Title Arctic Mass and Heat Transfer Arctic Mass and Heat Transfer Abbreviated Title for Transcript (30 character)									,			
7. Type of Course	Academic	Pre	paratory/Developm	nent		Non-c	redit		CEU	E F	Professional Developme	ent
8. Type of Action:	Add or 🛛 CI	nange or	Delete	9.	Repeat	Statu	s No	# of F	Repeats		Max Credits	
If a change, mark appropria Prefix Credits Title	Cours	e Number act Hours at Status		10.	. Grading	g Bas	is D	A-F	E 🗌 P.	/NP [	NG	
Grading Basis Course Descriptio	n 🛛 Cours	-Listed/Stack e Prerequisit quisites		11.	Implem From:		ion Date ng/2015	e semes		9/9999		
Other Restrictions	evel	tration Restri	ctions	12.	Cro	oss Li	sted with	n				
College IN					🗌 Sta	cked	with	n		Cros	ss-Listed Coordination Sigr	nature
13a. Impacted Courses of	•		• ·			•						
Please type into fields provid	ogram/Course		es, submit a separa		Die. A tem			le at <u>w</u>			governance. ordinator Contacted	
1. Arctic Engineering MS F	Program	336			1/24/2014	4			ele Zubec			
2. Engineering BS Program		261			12/6/2013	3		Jeff F	loffman			
Initiator Name (typed): H	annele Zubeck	Initiator Sign	ed Initials:				Date:					
13b. Coordination Email submitted to Faculty L	Date: <u>2/4/20</u> istserv: ( <u>uaa-faculty@I</u>		ka.edu)	130	c. Coordi	natio	n with Li	ibrary	Liaison	Date	e: <u>2/4/2014</u>	
14. General Education Mark app	Requirement ropriate box:	=	Oral Communication	=	Written Cor Social Scie		cation	=	uantitative S atural Scien		Humanities Integrative Capstone	
15. Course Description Introduces princip as ice and frost formation	oles of heat and m	ass transf					olicatior	n to pi	oblems	encour	ntered in the Arctic	c, such
16a. Course Prerequisite NA	e(s) (list prefix and nur	nber)	16b. Test Sco N/A	re(s)				Co-req N/A	uisite(s)	(concurre	ent enrollment required,	)
16d. Other Restriction(s)			16e. Registrat									
College Ma	ajor 🗌 Class 🛛	Level		d und	dergradua	ate pi	rogram i				ering, or upper class completed a thermoc	
17. 🛛 Mark if course I	has fees CoEng fee		18. 🗌 Mark i	f cou	rse is a s	elect	ed topic	cours	e			
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.												
					Approved							
Initiator (faculty only) Hannele Zubeck Initiator (TYPE NAME)			Date		Disapprov	ed [	Dean/Dire	ector of	School/Cc	ollege		Date
					Approved							
	nt Chairperson		Date		Disapprov		Undergrad Board Cha		Braduate A	cademic		Date
					Approved							
	n Committee Chairpers	on	Date		Disapprov	ed [	Provost o	r Desig	nee			Date

#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

Initi	ation Date:	February 20, 2014				
Cou	rse Information					
А.	College:	College of Engineering				
В.	Course Title:	Arctic Heat and Mass Transfer				
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 (	legree or certificate program:				
11.	Status of course relative to t	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				
К.	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

I.

II.

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. Information collection
- B. Regional temperature data
- C. Physical properties of construction materials
- D. Zone refining
- E. Fundamentals of heat transfer
- F. Temperature distribution in soils
- G. Temperature measurement
- H. Foundation design in cold regions
- I. Heat transfer in structures
- J. Heat and mass transfer in buried pipelines, roads, and utilidors
- K. Presenting research results

## 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	Homework assignments, exams and
	physical properties governing heat and mass transfer	term paper.
	in cold climates.	
2.	Interpret and apply associated specialized language	Homework assignments, exams and
	and units of measure.	term paper.
3.	Gather specialized scientific and engineering public	Homework assignments, exams and
	information about cold regions physical conditions.	term paper.
4.	Apply fundamental physical principles in solving	Homework assignments, exams and
	common cold regions engineering problems.	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,	Homework assignments, exams and		
	roof, and foundations.	term paper.		
7.	Predict moisture content and mass flow rates in	Homework assignments, exams and		
	structures.	term paper.		
8.	Determine soil freeze and thaw rates associated with	Homework assignments, exams and		
	buried pipelines and utilidors.	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.

- 1. Andersland, O., and Ladanyi, B., 2004. *Frozen Ground Engineering*, 2<sup>nd</sup>. 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].



1a. School or College EN SOENGR		1b. Division No Division Code				1c. Department Civil Engineering			
2. Course Prefix 3. Course Numbe AE A686	r 4. Previo	us Course Prefix	& Numbe	5a.	ia. Credits/CEUs 3		5b. Contact Hours (Lecture + Lab)		
AE     A000     3     (0+9)       6. Complete Course Title     Arctic Engineering Project     Arctic Engineering Project       Arctic Engineering Project     Abbreviated Title for Transcript (30 character)									
7. Type of Course X Academ	c 🗌 Pre	paratory/Developm	ient [	] Non-o	credit	CEU	Professional Development		
8. Type of Action: Add or Change or Delete 9. Repeat Status No # of Repeats Max Credits 3									
Credits Co	urse Number htact Hours beat Status		10. Gra	ding Ba	sis 🗵	] A-F 🗌 F	P/NP 🗌 NG		
Grading Basis Cro	ss-Listed/Stack				tion Date ng/2015	semester/year To: S	99/9999		
Other Restrictions Real Class Level	requisites gistration Restri	ctions	12. 🗌	Cross L	<b>isted</b> with				
College Major Other (please specify)				Stacked	d 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 <a href="www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a> .         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.									
Initiator Name (typed): <u>Hannele Zubeck</u>	Initiator Sign	ed Initials:			Date:_				
13b. Coordination Email Date: <u>2/4/</u> submitted to Faculty Listserv: ( <u>uaa-faculty</u> )		<u>ka.edu</u> )	13c. Co	ordinatio	on with Li	orary Liaison	Date: <u>2/4/2014</u>		
14. General Education Requirement Mark appropriate box:	=	Dral Communication	=	Commun Sciences	ication	Quantitative Natural Scie			
<ol> <li>Course Description (suggested length 2 Culminating project for MS Arctic and student to solve a practical cold r</li> </ol>	Engineering			arrang	ed amor	ig the adviso	r, graduate advisory committee		
16a. Course Prerequisite(s) (list prefix and r N/A	umber)	16b. Test Sco N/A	ore(s) 16c. Co-requisite(s) (concurrent enrollment required) N/A						
16d. Other Restriction(s)	🛛 Level		tion Restriction(s) <i>(non-codable)</i> te standing in Arctic Engineering with a completion of minimum of 9 graduate ering credits.						
17. X Mark if course has fees CoEng fe	e	18. 🗌 Mark	if course is	a selec	ted 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.									
			Appro	ved					
Initiator (faculty only) <u>Hannele Zubeck</u> Initiator (TYPE NAME)		Date	Disap	proved	Dean/Dire	ctor of School/C	ollege Date		
Approved			Appro			luate/Graduate /	Academic Date		
Disapproved Department Chairperson		Date			Board Cha	lirperson			
Approved     Disapproved     Curriculum Committee Chairpe	erson	Date	Appro	_	Provost or	Designee	Date		

#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

I. II.	Initiation Date: F Course Information		February 20, 2014				
	A.	College:	College of Engineering				
	B.	Course Title:	Arctic Engineering Project				
	C.	Course Subject/Number:	AE A686				
	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 de	egree 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 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 outline for reports.
  - 3. Provide students with understanding on the clarity, accuracy, precision, relevance, depth, breadth, logic, significance and fairness required for engineering research reports.
  - 4. Prepare students to 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	Project report
	pertinent to the research topics.	
4.	Comprehend the clarity, accuracy, precision,	Project report
	relevance, depth, logic, significance and fairness	
	required for engineering research reports.	
5.	Author professional engineering reports.	Project report

# VIII. Suggested Text: NA

- 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].



1a. School or College EN SOENGR		1b. Divisi No D	on livision Code							epartment vil Engineering	
2. Course Prefix	3. Course Number	4. Previo	us Course Prefix	& Nu	umber	5a.	Credits/	/CEUs	;		ontact Hours
AE	A689	CE A6	89				3				ecture + Lab) 3+0)
Cold Regions Pay Cold Regions Pave	6. Complete Course Title Cold Regions Pavement Design Cold Regions Pavement Design Abbreviated Title for Transcript (30 character)										
7. Type of Course	Academic	Pre	paratory/Developm	ent	ı 🗌	Non-c	redit		CEU	D P	Professional Development
		nange or	Delete	9.	Repeat	Statu	s No	# of I	Repeats		Max Credits
If a change, mark approp	Cours	se Number act Hours		10.	Grading	g Bas	is D	⊠ A-F	= 🗆 P/	/NP	NG
☐ Title ☐ Grading Basis ☐ Course Descrip ☐ Test Score Pre	otion I Cross	at Status -Listed/Stack se Prerequisit		11.	Implem From:		ion Date ng/2015	e seme	•	9/9999	
Other Restrictio	ons 🛛 Regis ] Level	quisites tration Restri	ctions	12.	Crc	oss Li	sted with	n			
~ _	] Major lease specify)				🗌 Sta	cked	with	n		Cros	ss-Listed Coordination Signature
13a. Impacted Course	•		•			•				-1	
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1. Master of Science Ar 2.	ctic Engineering	337			1/24/2014			Hanr	ele Zubecl		
3.											
Initiator Name (typed):	Hannele Zubeck	Initiator Sign	ed Initials:				Date:				
13b. Coordination Em submitted to Facult	ail Date: <u>2/4/20</u> y Listserv: ( <u>uaa-faculty@</u> ]		a.edu)	130	c. Coordi	natio	n with Li	ibrary	Liaison	Date	e: <u>2/4/2014</u>
14. General Educatio Mark a	on Requirement ppropriate box:	=	oral Communication ine Arts		Written Con Social Scier		cation	=	Quantitative S latural Scien		Humanities     Integrative Capstone
15. Course Descripti Topics include expected service life	design, maintenanc		abilitation of pav	veme	ent struc	ture	s in col	d regi	ons whe	re frost	t, snow and ice threaten
16a. Course Prerequie NA	site(s) (list prefix and nu	nber)	16b. Test Sco N/A	ore(s) 16c. Co-requisite(s) (concurrent enrollment required) N/A					ent enrollment required)		
16d. Other Restriction	(s)		16e. Registrat								
☐ College ☐ Major ☐ Class ⊠ Level Graduat in an accredite					te standing, with a baccalaureate degree in engineering, or upper class standing ad undergraduate program in engineering, having completed a tansportation burse with a minimum grade of C.						
17. 🛛 Mark if cours	e has fees CoEng fee		18. 🗌 Mark i	f cou	rse is a s	elect	ed topic	cours	е		
For identity and	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.											
				П	Approved						
Initiator (faculty only)			Date		Disapprove	ed r	Dean/Dire	ector of	School/Co	llege	Date
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Approved					Approved		Jndergrad	duate/0	Graduate A	cademic	Date
Disapproved Departr	ment Chairperson		Date		Disapprove		Board Cha				But
Approved					Approved						
Disapproved Curricu	lum Committee Chairpers	on	Date		Disapprove	ed F	Provost o	r Desig	nee		Date

#### UNIVERSITY OF ALASKA ANCHORAGE COURSE CONTENT GUIDE

#### I. Initiation Date: February

#### **II.** Course Information

- A. College:
- B. Course Title:
- C. Course Subject/Number:
- D. Credit Hours:
- E. Contact:
- F. Grading Information:
- G. Course Description:

February 20, 2014

College of Engineering

Cold Regions Pavement Design AE A689 3.0 3+0 A-F Topics include 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:

I.	Lab Fees:	Applies to the MS program in Arctic Engineering 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 Outline

- Cold regions pavements
- Pavement environment
- Calculation of engineering parameters
- Pavement deterioration modes
- Soil investigation and material testing
- Design approaches
- Mix design of bound layers
- Pavement structural design
- Maintenance and rehabilitation
- Pavements on permafrost
- Presenting research results

## 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	Homework assignments, exams,		
	regions.	term paper.		
2.	Analyze failure modes of pavements under the effects	Homework assignments, exams,		
	of traffic, environmental stresses and the combination	term paper.		
	of the two.			
3.	Manage site investigations and material testing.	Homework assignments, exams,		
		term paper.		
4.	Evaluate alternatives for design and maintenance	Homework assignments, exams,		
	techniques, strategies and their financial impacts.	term paper.		
5.	Manage and perform pavement designs in cold	Homework assignments, exams,		
	regions.	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.

- 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].



1a. School or College AS CAS	2	1b. Divisio AMS		n of M	ath Science	9	1c. Department Biological Sciences				
2. Course Prefix	3. Course Number	4. Previou	s Course	Prefix	& Number	5a. (	Credits/CEUs	S	5b. Contact Hours		
BIOL	A662	N/A				:	3		(Lecture + Lab) (3+0)		
	6. Complete Course Title Advanced Virology Advanced Virology										
7. Type of Course	Academic	Prep	paratory/Dev	/elopm	ent	Non-cre	edit	CEU	Professional Development		
8. Type of Action:	Add or 🛛 C	nange or	🗌 Del	ete	9. Repeat	Status	No # of	Repeats	Max Credits		
If a change, mark approp	Cours	se Number act Hours			10. Gradin	g Basis	s 🛛 A-I	F 🗌 P/N	IP 🗌 NG		
☐ Title ☐ Grading Basis ⊠ Course Descrip ☐ Test Score Pre	otion I Cross	at Status -Listed/Stacke e Prerequisite quisites				nentatio Fall/20	on Date seme 015	ester/year To: Fall/9	999		
Automatic Rest	rictions Regis	tration Restric		nt	12. 🗌 Cr	oss Lis	ted with				
College C Other CCG (ple					Signature Sta	acked	with BIO	DL A462	Cross-Listed Coordin	ation	
13a. Impacted Course	-		-								
Please type into fields pro	ovided in table. If more the Impacted Program/Course		es, submit a		te table. A ten		available at <u>w</u>		ka.edu/governance. rdinator Contacted	٦	
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2.										-	
Initiator Name (typed)	Khrys Duddleston	Initiator Signe	ed Initials:				Date:		_	-	
13b. Coordination Em submitted to Facult	ail Date: <u>6Jan1</u> y Listserv: ( <u>uaa-faculty@I</u>		a.edu)		13c. Coord	ination	with Library	Liaison	Date: <u>6Jan14</u>		
14. General Educatio Mark a	on Requirement ppropriate box:	=	ral Communic ne Arts	ation	Written Co Social Sci		=	Quantitative Sk Natural Science	=		
	cepts in human virol st cells, immune res	ogy, an in-o ponses and	d disease	path	ogenesis. V	'iral ge			ictures, viral life cycles, nergence, and advanced		
16a. Course Prerequi code and score)	site(s) (list prefix and nui	nber or test	16b. Co-	requis	ite(s) <i>(concur</i>	rent enr	ollment require	əd)			
16c. Automatic Restric		Level			tion Restriction(s) <i>(non-codable)</i> ee Standing						
17. Mark if course has fees 18. Mark					if course is a selected topic course						
	19. Justification for Action Update of CAR and CCG, change in pre-requisites										
				_							
Initiator (faculty only) Khrys Duddleston Initiator (TYPE NAME)			Date		Disappro	ved D	ean/Director of	t School/Colle	ege	Date	
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	nent Chair		Date		Disapprov		ndergraduate/ oard Chair	Graduate Aca	ademic	Date	
Approved					Approved						
Disapproved College	School Curriculum Comn	nittee Chair	Date		Disapprov	ved P	rovost or Desig	gnee		Date	

#### **University of Alaska Anchorage College of Health Course Content Guide**

**Date of Initiation:** Spring 2014 II. **Curriculum Action Request** A. College: College of Arts and Sciences B. Course Prefix: BIOL A662 C. Course Number: D. Number of Credits: 3 E. Contact Hours: 3+0F. Course Title: Advanced Virology G. Grading Basis: A-F H. Implementation Date: Fall 2015 I. Cross-listed/Stacked: **BIOL A462** J. Course Description: Advanced concepts in human virology, an in-depth focus on cell and molecular biology of virus structures, viral life cycles, interactions with host cells, immune responses and disease pathogenesis. Viral genomics, evolution, emergence, and advanced experimental methods for analyzing virus genome sequences will be discussed. K. Course Prerequisites: N/A L. Course Co-requisites: N/A M. Other Restrictions: N/A N. Registration Restrictions: Graduate Standing O. Course Fees: No

#### III. **Instructional Goals and Student Learning Outcomes**

A. Instructional Goals. The instructor will:

I.

- 1. Present an integrated synthesis of concepts in modern virology, focused on molecular analyses of virus genomes, proteins, virion structures, virus-host interactions, viral life cycles, and experimental methods in virology.
- 2. Discuss how genetics, molecular and cell biology of virus replication is critical for understanding of pathogenesis of viral diseases in humans, including disease processes on the cellular level, immune responses, viral evasion of immunity, and the development of vaccines.
- 3. Conceptualize virus genomes and how they contribute to evolution and emergence of viruses, and facilitate student use of analytical and bioinformatics methods to understand virus genome sequences.
- 4. Facilitate student learning of current, prescient topics in virology by guided discussion of select scientific literature and recent biotechnological advancements that impact understanding of viruses.
- 5. Guide graduate student learning of advanced concepts from recent virology research modeled from the primary scientific literature.

B. Student Learning Outcomes and Assessment Measures

Student Learning Outcomes: Upon completion of	Assessment Measures
this course, the student will be able to:	
1. Apply basic principles of cell biology,	Written assignments, quizzes, and
molecular biology, and genetics to describe	examinations
virus genomes, structures, replication, gene	
expression, host cell interactions, and life	
cycles at molecular and cellular levels.	
2. Analyze, summarize and critically discuss	Written assignments, quizzes, and
virus genes, virus genomes, virulence factors,	examinations
immune responses to viruses, and	
pathogenesis of viral diseases in humans.	
3. Synthesize biological concepts involved in	Written assignments, quizzes, and
virus emergence and evolution, and describe	examinations
molecular methods for characterizing viral	
genomes and disease processes.	
4. Develop scientific analytical skills by	Written assignments, research paper
molecular analysis of virus genomes and	assignment, multimedia assignment, group
protein structures, including bioinformatics	discussion, and examinations
approaches, and by analyzing select primary	
and secondary scientific literature.	
5. Integrate and model advanced concepts in	Written assignments, research proposal, and
virology derived from scientific literature, and	literature discussions
develop hypotheses for new research.	

#### **IV.** Course Level Justification

This course is an advanced interdisciplinary course comparable to graduate level virology courses offered at other universities. Students must synthesizes concepts from the scientific literature across disciplines.

#### V. Topical Course Outline

- A. Introduction to virology
  - 1. Virology is an interdisciplinary study
  - 2. Virology is an experimental science
  - 3. Virology is the study of biological systems
- B. Case study: group discussion on emergence of a novel virus
- C. Integrated biological concepts needed in virology

1. Genome organization

2. Molecular biology of eukaryotic DNA replication

3. Molecular biology of gene expression

4. Eukaryotic cell cycle

5. Compartmentalized subcellular structures

6. Cellular signal transduction

7. Protein structure and function

- D. Virus life cycle
  - 1. Production of progeny virus
  - 2. Bacteriophage growth kinetics

- 3. Experimental methods for measuring viruses during life cycle
- E. Virus structures
  - 1. Virion structures, composition, and functional compartments
  - 2. Electron microscopy methods for studying virion structures
  - 3. Virion entry and egress
  - 4. Structure and function of virion proteins
    - a. Receptor-binding proteins
    - b.Fusion proteins
- F.Virus genomes and replication
  - 1. Virus classification and families
  - 2.RNA virus genomes and genes
  - 3.DNA virus genomes and genes
  - 4. Virus gene expression
  - 5. Virus replication strategies
    - a. Acute RNA virus infection
    - b. Chronic DNA virus infection
    - c. Retrovirus infection
- G. Immune response to viruses
  - 1. Innate immune response
  - 2. Adaptive immune response
  - 3. Viral evasion of innate and adaptive immune responses
  - 4. Virus accessory genes in virulence
  - 5. Molecular basis of vaccination
- H. Pathogenesis of viral diseases
  - 1. Acute respiratory infections
  - 2. Hemorrhagic fever viruses
  - 3.HIV/AIDS
  - 4. Hepatitis viruses and cancer
  - 5.DNA tumor viruses
- I. Viral bioinformatics and genomics
  - 1. Molecular basis of information flow in biological systems
  - 2. Bioinformatics for virus sequence analysis
  - 3.Genomics methods for virus sequencing
  - 4. Systems biology of virus-host interactions
- J. Emerging viruses
  - 1. Ecology of outbreaks
  - 2. Vector-borne viruses
  - 3.Zoonoses species jumping across the animal:human interface
  - 4. Epidemiology of emerging infections
- K. Current topics in virology
  - 1. This Week in Virology
    - a. Multimedia assignment
    - b. Group discussion
    - 2. Biosecurity of highly pathogenic viruses
    - 3. Vaccines
      - a. Antigenicity
      - b. Efficacy
      - c. Vaccination controversies
    - 4. Antiviral drugs
      - a. Mechanisms of action
      - b. Drug resistance

- 5. Synthetic viruses in biotechnology
- L. Graduate level synthesis and modeling of advanced concepts in virology
  - 1. Discussion of primary scientific literature
    - a. Multimedia assignment
    - b. Group discussion
    - c. Graduate student journal article discussion
  - 2. Research proposal to address gap in knowledge in virology

#### VI. Suggested Texts

Carter, J., V. Saunders. Virology: Principles and Applications. 2nd ed. Chichester, UK: Wiley & Sons; 2013.

Flint, S.J., L.W. Enquist, V.R. Racaniello, A.M. Shalka. Principles of Virology: Molecular Biology, Pathogenesis, and Control of Animal Viruses. 2nd ed. ASM Press; 2003.

Readings from primary literature and review articles from scientific journals, for example: New England Journal of Medicine Nature The Lancet PLoS Pathogens mBio Science Emerging Infectious Diseases

#### VII. Bibliography

Barzon L, Lavezzo E, Militello V, Toppo S, Palù G. 2011. Applications of next-generation sequencing technologies to diagnostic virology. Int J Mol Sci. 12(11):7861-84.

Carter, J., V. Saunders. Virology: Principles and Applications. 2nd ed. Chichester, UK: Wiley & Sons; 2013.

Delwart E. 2013 A roadmap to the human virome. PLoS Pathog. 9(2):e1003146.

Drexler JF, Corman VM, Müller MA, Maganga GD, Vallo P, Binger T, Gloza-Rausch F, Rasche A, Yordanov S, Seebens A, Oppong S, Adu Sarkodie Y, Pongombo C, Lukashev AN, Schmidt-Chanasit J, Stöcker A, Carneiro AJ, Erbar S, Maisner A, Fronhoffs F, Buettner R, Kalko EK, Kruppa T, Franke CR, Kallies R, Yandoko ER, Herrler G, Reusken C, Hassanin A, Krüger DH, Matthee S, Ulrich RG, Leroy EM, Drosten C. 2012 Bats host major mammalian paramyxoviruses. Nat Commun. 24:3:796.

Fauci AS, Morens DM. 2012. The perpetual challenge of infectious diseases. N Engl J Med. 366(5):454-61.

- Fine P, Eames K, Heymann DL. 2011. "Herd immunity": a rough guide. Clin Infect Dis. 52(7):911-6. doi: 10.1093/cid/cir007.
- Flint, S.J., L.W. Enquist, V.R. Racaniello, A.M. Shalka. Principles of Virology: Molecular Biology, Pathogenesis, and Control of Animal Viruses. 2nd ed. ASM Press; 2003.

Ganley ML. 1998. The dispersal of the 1918 influenza virus on the Seward Peninsula, Alaska: an ethnohistoric reconstruction. Int J Circumpolar Health 57 S1:247-51.

Gao R, Cao B, Hu Y, Feng Z, Wang D, Hu W, Chen J, Jie Z, Qiu H, Xu K, Xu X, Lu H, Zhu W, Gao Z, Xiang N, Shen Y, He Z, Gu Y, Zhang Z, Yang Y, Zhao X, Zhou L, Li X, Zou S, Zhang Y, Li X, Yang L, Guo J, Dong J, Li Q, Dong L, Zhu Y, Bai T, Wang S, Hao P, Yang W, Zhang Y, Han J, Yu H, Li D, Gao GF, Wu G, Wang Y, Yuan Z, Shu Y. 2013. Human infection with a novel avian-origin influenza A (H7N9) virus. N Engl J Med. 368(20):1888-97.

- Korsman, S.N.J., G.Van Zyl, W. Preiser, L. Nutt, M.I. Andersson. Virology: an Illustrated Color Text. Churchill Livingstone Elsevier; 2012.
- Schelhaas M. 2010. Come in and take your coat off how host cells provide endocytosis for virus entry. Cell Microbiol. 12(10):1378-88.
- Sharp PM, Hahn BH. Origins of HIV and the AIDS pandemic. Cold Spring Harb Perspect Med. 2011 Sep;1(1):a006841.

Taubenberger JK, Kash JC. 2011. Insights on influenza pathogenesis from the grave. Virus Res. 162 (1-2):2-7.

Tscherne DM, García-Sastre A. 2011. Virulence determinants of pandemic influenza viruses. J Clin Invest. 121(1):6-13.

- van Boheemen S, de Graaf M, Lauber C, Bestebroer TM, Raj VS, Zaki AM, Osterhaus AD, Haagmans BL, Gorbalenya AE, Snijder EJ, Fouchier RA. 2012. Genomic characterization of a newly discovered coronavirus associated with acute respiratory distress syndrome in humans. mBio. 20:3(6).
- Watanabe Y, Ibrahim MS, Suzuki Y, Ikuta K. 2012. The changing nature of avian influenza A virus (H5N1). Trends Microbiol. 20(1):11-20.

Weaver SC, Reisen WK. 2010. Present and future arboviral threats. Antiviral Res. 85(2):328-45.

Wenger JD, Castrodale LJ, Bruden DL, Keck JW, Zulz T, Bruce MG, Fearey DA, McLaughlin J, Hurlburt D, Hummel KB, Kitka S, Bentley S, Thomas TK, Singleton R, Redd JT, Layne L, Cheek JE, Hennessy TW. 2011. 2009. Pandemic influenza A H1N1 in Alaska: temporal and geographic characteristics of spread and increased risk of hospitalization among Alaska Native and Asian/Pacific Islander people. Clin Infect Dis. 52 Suppl 1:S189-97.

Wynne JW, Wang LF. 2013. Bats and viruses: friend or foe? PLoS Pat



1a. School or College AS CAS		1b. Division AMSC Division of Math Science							partment plogical Sciences	
2. Course Prefix	3. Course Number	4. Previous Course Prefix			Number 5a. Credits/CEUs			intact Hours		
BIOL	A462	N/A				3	3		ecture + Lab) +0)	
6. Complete Course T Virology Virology Abbreviated Title for Transcri								X-		
7. Type of Course Academic Preparatory/Development Non-credit CEU Professional Development										
8. Type of Action: Add or Change or Dele				9. Repeat Status No # of Repeats Max Credits						
If a change, mark approp										
Prefix Credits	se Number act Hours			10. Grading Basis 🛛 A-F 🗌 P/NP 🗌 NG						
□       Title       □       Repeat Status         □       Grading Basis       □       Cross-Listed/Stack         □       Course Description       □       Course Prerequisites         □       Test Score Prerequisites       □       Co-requisites         □       Automatic Restrictions       □       Registration Restri         □       Class       □       Level       □         □       College       □       Major         ☑       Other CCG (please specify)       □       □				11. Implementation Date semester/year From: Fall/2015 To: Fall/9999						
					12. Cross Listed with					
				Signa	Signature Stacked with BIOL A662 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 <a href="http://www.uaa.alaska.edu/governance">www.uaa.alaska.edu/governance</a> .										
Impacted Program/Course D					Coordinat	ion	Chair	Coordinator	Contacted	
2.										
L	Khrvs Duddleston	Initiator Signed Initia	ls:				Date:			
Initiator Name (typed): Khrys Duddleston       Initiator Signed Initials:       Date:         13b. Coordination Email       Date: 6Jan2013       13c. Coordination with Library Liaison       Date: 6Jan2013         submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)       13c. Coordination with Library Liaison       Date: 6Jan2013										
14. General Education Requirement Mark appropriate box:       Oral Communication					Written Cor Social Scie		tion Quantitation	Ē	Humanities Integrative Capstone	
<ol> <li>Course Description (suggested length 20 to 50 words) Concepts in human virology, with an introduction to cell and molecular biology of virus structures, viral life cycles, interactions with host cells, immune responses and disease pathogenesis. Discusses viral genomics, evolution, emergence, and advanced experimental methods for analyzing virus genome sequences.</li> </ol>										
16a. Course Prerequisite(s) (list prefix and number or test code and score)       16b. Co-requisite(s) (concurrent enrollment required)         [BIOL A242 and BIOL A252] with minimum grade of C										
				d. Registration Restriction(s) (non-codable)						
College Major Class Level										
17. Mark if course has fees 18.			Mark if course is a selected topic course							
19. Justification for Action Changing pre-requisites to better reflect need for course.										
					Approved					
Initiator (faculty only) Khrys Duddleston		D	ate		Disapprove	ed De	ean/Director of School/	College	Date	
Initiator (TYPE NAME)				_						
	ant Chair			_	Approved		ndergraduate/Graduate	e Academic	Date	
Disapproved Departn	nent Chair	L	late		Disapprove	ea BC	bard Chair			
Approved				_	Approved					
Disapproved College	School Curriculum Comr	hittee Chair E	Date		Disapprove	ed Pr	ovost or Designee		Date	

#### University of Alaska Anchorage College of Arts and Sciences Course Content Guide

I.	Date of Initiation:	Spring 2014
II.	Curriculum Action Request	
	A. College:	College of Arts and Sciences
	B. Course Prefix:	BIOL
	C. Course Number:	A462
	D. Number of Credits:	3
	E. Contact Hours:	3+0
	F. Course Title:	Virology
	G. Grading Basis:	A-F
	H. Implementation Date:	Fall 2015
	I. Cross-listed/Stacked:	BIOL A662
	J. Course Description:	Concepts in human virology, with an introduction to cell and molecular biology of virus structures, viral life cycles, interactions with host cells, immune responses and disease pathogenesis. Discusses viral genomics, evolution, emergence, and advanced experimental methods for analyzing virus genome sequences.
	K. Course Prerequisites:	[BIOL A242 and BIOL A252] with minimum grade of C.
	L. Course Co-requisites:	N/A
	M. Other Restrictions:	N/A
	N. Registration Restrictions:	N/A
	O. Course Fees:	No

#### III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:

- 1. Present a synthesis of concepts in modern virology, focused on molecular analyses of virus genomes, proteins, virion structures, virus-host interactions, viral life cycles, and experimental methods in virology.
- 2. Discuss how genetics, molecular, and cellular biology of virus replication facilitates understanding of pathogenesis of viral diseases in humans. Includes disease processes on the cellular level, immune responses, viral evasion of immunity, and the development of vaccines.
- 3. Discuss virus genomes and how they contribute to evolution and emergence of viruses.
- 4. Facilitate student use of analytical and bioinformatics methods to understand virus genome sequences.
- 5. Facilitate student learning of current, prescient topics in virology by guided discussion of select scientific literature and recent biotechnological advancements that impact understanding of viruses.

B. Student Learning Outcomes and Assessment Measures

Student Learning Outcomes: Upon completion of	Assessment Measures
this course, the student will be able to:	
1. Apply basic principles of cell biology,	Written assignments, quizzes, and
molecular biology, and genetics to describe	examinations
virus genomes, structures, replication, gene	
expression, host cell interactions, and life	
cycles at molecular and cellular levels.	
2. Analyze and critically discuss virus genes,	Written assignments, quizzes, and
virus genomes, virulence factors, immune	examinations
responses to viruses, and pathogenesis of viral	
diseases in humans.	
3. Synthesize biological concepts involved in	Written assignments, quizzes, and
virus emergence and evolution, and describe	examinations
molecular methods for characterizing viral	
genomes and disease processes.	
4. Develop scientific analytical skills by	Written assignments, research paper
molecular analysis of virus genomes and	assignment, multimedia assignment, graded
protein structures, including bioinformatics	group discussion, and examinations
approaches, and by analyzing select primary	
and secondary scientific literature.	

#### IV. Course Level Justification

This course builds upon required pre-requisites in cell biology and genetics and requires students to synthesize concepts across disciplines.

#### V. Topical Course Outline

A. Introduction to virology

- 1. Virology is an interdisciplinary study
- 2. Virology is an experimental science
- 3. Virology is the study of biological systems
- B. Case study: group discussion on emergence of a novel virus
- C. Integrated biological concepts needed in virology
  - 1. Genome organization
  - 2. Molecular biology of eukaryotic DNA replication
  - 3. Molecular biology of gene expression

4. Eukaryotic cell cycle

- 5. Compartmentalized subcellular structures
- 6. Cellular signal transduction
- 7. Protein structure and function
- D. Virus life cycle
  - 1. Production of progeny virus
  - 2. Bacteriophage growth kinetics
  - 3. Experimental methods for measuring viruses during life cycle
- E. Virus structures
  - 1. Virion structures, composition, and functional compartments

- 2. Electron microscopy methods for studying virion structures
- 3. Virion entry and egress
- 4. Structure and function of virion proteins
  - a. Receptor-binding proteins
  - b. Fusion proteins
- F.Virus genomes and replication
  - 1. Virus classification and families
  - 2.RNA virus genomes and genes
  - 3.DNA virus genomes and genes
  - 4. Virus gene expression
  - 5. Virus replication strategies
    - a. Acute RNA virus infection
    - b. Chronic DNA virus infection
    - c. Retrovirus infection
- G. Immune response to viruses
  - 1. Innate immune response
  - 2. Adaptive immune response
  - 3. Viral evasion of innate and adaptive immune responses
  - 4. Virus accessory genes in virulence
  - 5. Molecular basis of vaccination
- H. Pathogenesis of viral diseases
  - 1. Acute respiratory infections
  - 2. Hemorrhagic fever viruses
  - 3.HIV/AIDS
  - 4. Hepatitis viruses and cancer
  - 5.DNA tumor viruses
- I. Viral bioinformatics and genomics
  - 1. Molecular basis of information flow in biological systems
  - 2. Bioinformatics for virus sequence analysis
  - 3. Genomics methods for virus sequencing
  - 4. Systems biology of virus-host interactions
- J. Emerging viruses
  - 1. Ecology of outbreaks
  - 2. Vector-borne viruses
  - 3.Zoonoses species jumping across the animal:human interface
  - 4. Epidemiology of emerging infections
- K. Current topics in virology
  - 1. This Week in Virology
    - a. Multimedia assignment
    - b. Group discussion
  - 2. Biosecurity of highly pathogenic viruses
  - 3. Vaccines
    - a. Antigenicity
    - b. Efficacy
    - c. Vaccination controversies
  - 4. Antiviral drugs
    - a. Mechanisms of action
    - b. Drug resistance
  - 5. Synthetic viruses in biotechnology

#### VI. Suggested Texts

Carter, J., V. Saunders. Virology: Principles and Applications. 2nd ed. Chichester, UK: Wiley & Sons; 2013.

Excerpts from primary literature and review articles from scientific journals, for example: New England Journal of Medicine Nature The Lancet PLoS Pathogens mBio

#### VII. Bibliography

Barzon L, Lavezzo E, Militello V, Toppo S, Palù G. 2011. Applications of next-generation sequencing technologies to diagnostic virology. Int J Mol Sci. 12(11):7861-84.

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