Graduate Academic Board

Agenda

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

I. Roll Call

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

II. Approval of Agenda (pg. 1)

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

IV. Administrative Reports

A. Associate Dean of the Graduate School David Yesner

B. University Registrar Lora Volden

C. GAB Chair Arlene Schmuland

V. Program/Course Action Request - Second Readings

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.

Graduate Academic Board

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	**Ex-Officio Members**
(x) Cindy Knall	(x) Dennis Drinka	(x) Clayton Trotter	(x) Sam Thiru	(x) David Yesner
(e) Jervette Ward	() FS at Large	() FS at Large	() FS at Large	() Lora Volden
() FS CAS				(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 9th and 23rd meetings to January 16th and 30th to accommodate the Provost Search Committee on January 9th and Faculty Senate Spring Forum on January 23rd.

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

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

Add Prefix, 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 10th 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	1c. Department
AS CAS	ASSC Division of Social Science	Anthropology

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ANTH	A615	N/A	3	(3+0)

6. Complete Course Title
Advanced Applied Anthropology

Abbreviated Title for Transcript (30 character)

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with _____
☒ Stacked with ANTH A415
Signature Cross-Listed Coordination

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

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

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Anthropology MA	10/31/2013	Paul White
2.		
3.		

Initiator Name (typed): Sally Carraher Initiator Signed Initials: _____ Date:_____

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
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.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
undertraduate cultural anthropology course with a minimum grade of C.

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

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

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

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
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.

Initiator (faculty only) Date
Sally Carraher
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved
Department Chair Date

☐ Approved
☐ Disapproved
College/School Curriculum Committee Chair Date

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

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved
Provost or Designee Date

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. http://www.aaanet.org/committees/ethics/ethcode.html.
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, 2nd 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, 4th 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. http://ohsr.od.nih.gov/guidelines/belmont.html.

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

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

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
ANTH	A415	N/A	3	(3+0)

6. Complete Course Title
Applied Anthropology

Abbreviated Title for Transcript (30 character)

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

☒ Stacked with ANTH A615

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

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

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. BA/BS Anthropology	10/31/2013	Paul White
2.		
3.		

Initiator Name (typed): Sally Carraher Initiator Signed Initials: _____ Date:_____

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
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.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*	16b. Co-requisite(s) *(concurrent enrollment required)*
ANTH A202, minimum grade of C	
16c. Automatic Restriction(s) ☐ College ☐ Major ☐ Class ☐ Level	16d. Registration Restriction(s) *(non-codable)*
17. ☐ Mark if course has fees	18. ☐ Mark if course is a selected topic course

19. Justification for Action
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).

Initiator (faculty only) Date
Sally Carraher
Initiator (TYPE NAME)

☐ Approved ☐ Disapproved Department Chair Date

☐ Approved ☐ Disapproved College/School Curriculum Committee Chair Date

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

☐ Approved ☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved ☐ Disapproved Provost or Designee Date

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 upper-division 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

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
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. http://www.aaanet.org/committees/ethics/ethcode.html.
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, 2nd 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.
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B. Recent literature:

1. Benard, Russell H. 2006. Research Methods in Anthropology, 4th 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. http://ohsr.od.nih.gov/guidelines/belmont.html.

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

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

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

6. Complete Course Title
Advanced Culture and Ecology

Abbreviated Title for Transcript (30 character)

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
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.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
Undergraduate course in cultural anthropology required with a minimum C grade

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

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

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

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

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

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

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Date of Initiation Date: Fall 2013

II. Course Information

A. College:	College of Arts and Sciences
B. Course Prefix	ANTH
C. Course Number	A654
D. Number of Credits	3
E. Contact Hours	3+0
F. Course Title:	Advanced Studies in Culture and Ecology
G. Grading Basis:	A-F
H. Implementation Date	Spring 2015
I. Course Description:	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.
J. Status of Course Relative to a Degree or Certificate Program:	Elective in the MA Anthropology
K. Course Fees:	No
L. Registration Restrictions:	Graduate Standing
M. Stacking	ANTH A454

III. Course Activities

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

IV. Course Evaluation

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

V. Course 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

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

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

VII. Topical Outline:

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:

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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:

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

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

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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

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

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

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

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

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

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

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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	1b. Division	1c. Department
AS CAS	ASSC Division of Social Science	Anthropology

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

6. Complete Course Title
Culture and Ecology

Abbreviated Title for Transcript (30 character)

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

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

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

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

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

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

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Date of Initiation Date: Fall 2013

II. Course Information

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

III. Course Activities

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

IV. Course Justifications:

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

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

V. Instructional Goals and Defined Outcomes

A. Instructional Goals. The Instructor will:

1. Present fundamental ecological concepts and their relationship to human societies

2. Discuss human adaptations from a variety of cultural perspectives

3. Describe the impacts of environmental changes on human societies, and of human societies on their environments

4. Relate the traditions of environmental anthropology and their perspectives on human/environment interactions

5. Present Western and non-Western (indigenous) perspectives on ecological knowledge

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

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

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:

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.

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

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

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

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

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

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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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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.

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

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*Classic References

**Sources that illustrate historic development of the field

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

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

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A603	CE A603	3	(3+0)

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with _____
☒ Stacked with AE A403
Signature Cross-Listed Coordination

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

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

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. MS of Arctic Engineering	336	1/24/2014	Hannele Zubeck
2. BS of Engineering, EE/ME	260, 261	12/6/2013	Jeff Hoffman/Jens Munk
3.			

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

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
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.

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

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

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

17. ☒ Mark if course has fees Standard Engineering Fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic 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 degree 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

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 designs.	Homework assignments, exams and term paper.
2. Conduct basic heat transfer calculations with an ability to convert units of measure.	Homework assignments, exams and term paper.
3. Evaluate the effects of ice and snow on arctic infrastructure.	Homework assignments, exams and term paper.
4. Evaluate the effects of ground freezing on foundations and roads.	Homework assignments, exams and term paper.
5. Evaluate the effects of freezing air temperatures and snow on building design.	Homework assignments, exams and term paper.
6. Avoid design failures of arctic utilities due to arctic conditions.	Homework assignments, exams and term paper.

7. Evaluate the effects of arctic conditions on construction, winter safety and survival.	Homework assignments, exams and term paper.
8. Use psychrometric chart and calculate moisture migration in structures.	Homework assignments, exams and term paper.
9. Evaluate the effects of arctic conditions to electrical engineering projects.	Homework assignments, exams and 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,* 2nd 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	1b. Division	1c. Department
EN SOENGR	No Division Code	Civil Engineering

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A403	CE A403	3	(3+0)

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with _____
☒ Stacked with AE A603
Signature Cross-Listed Coordination

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

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

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. BS of Civil Engineering	254	1/24/2014	Osama Abaza
2. BS of Construction Management	223	2/4/2014	Jeffrey Callahan
3. BS of Engineering, EE/ME	260, 261	12/6/2013	Jens Munk/Jeff Hoffman

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

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to 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.

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

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

16e. Registration Restriction(s) *(non-codable)*
Junior or senior standing in an accredited undergraduate program in engineering or construction management.

17. ☒ Mark if course has fees Standard Engineering fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic 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 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
K.	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

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:

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

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*, 2nd 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]

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

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

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

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

VIII. Suggested Text

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

IX. Bibliography and Resources

1. Doré, G. and Zubeck, H., 2009. *Cold Regions Pavement Engineering*, ASCE Press, Reston, VA.
2. Eranti, E., and Lee, G., 2000. *Cold Region Structural Engineering*, McGraw-Hill, New York, NY.
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].

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

15. Course Description *(suggested length 20 to 50 words)*
Introduces students to factors governing design of engineering works contending with the presence of ice. 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.

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

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

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

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Ice Engineering
C.	Course Subject/Number:	AE A682
D.	Credit Hours:	3.0
E.	Contact:	3+0
F.	Grading Information:	A-F
G.	Course Description:	Introduces students to factors governing design of engineering works contending with the presence of ice. 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 degree or certificate program:	Applies to the MS program in Arctic Engineering.
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	None
L.	Registration Restrictions:	Graduate standing, with a baccalaureate degree in engineering, or upper class standing in an accredited undergraduate program in engineering, having completed a mechanics of materials course with a minimum grade of C.

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

VI. Course 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 efficiency of human endeavors in cold regions.	Homework assignments, exams and term paper.
8. Author papers acceptable for publication.	Term paper.

VIII. Suggested Text:

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

IX. Bibliography and Resources

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

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees SCoEng fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

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

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

VI. Outline

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

VII. Instructional Goals and Student Learning Outcomes

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

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

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

VIII. Suggested Text

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

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

IX. Bibliography and Resources

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

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees SCoEng

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved
Department Chairperson Date

☐ Approved
☐ Disapproved
Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved
Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved
Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

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

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

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

VIII. Suggested Text:

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

IX. Bibliography and Resources

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

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved ☐ Disapproved Department Chairperson Date

☐ Approved ☐ Disapproved Curriculum Committee Chairperson Date

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

☐ Approved ☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved ☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

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

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

VI. Outline

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

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

VIII. Suggested Text

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

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

IX. Bibliography and Resources

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

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

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

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
AE	A686		3	(0+9)

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits 3

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

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

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

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

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

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

A.	College:	College of Engineering
B.	Course Title:	Arctic Engineering Project
C.	Course Subject/Number:	AE 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 degree or certificate program:	Applies to the MS program in Arctic Engineering
I.	Lab Fees:	CoEng fee
J.	Coordination:	UAA/CoEng/CE faculty list serves
K.	Course Prerequisites:	NA
L.	Registration Restrictions:	Graduate standing in Arctic Engineering with a completion of minimum of 9 graduate Arctic Engineering credits.

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

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

VI. Course Outline

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

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

VII. Instructional Goals and Student Learning Outcomes

A. Instructional Goals. The instructor will:
   1. Provide students with understanding 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 pertinent to the research topics.	Project report
4. Comprehend the clarity, accuracy, precision, relevance, depth, logic, significance and fairness required for engineering research reports.	Project report
5. Author professional engineering reports.	Project report

VIII. Suggested Text: NA

IX. Bibliography and Resources

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

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

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

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

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with

☐ Stacked with _____ Cross-Listed Coordination Signature

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

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

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

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

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

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

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

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

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

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

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

17. ☒ Mark if course has fees CoEng fee

18. ☐ Mark if course is a selected topic course

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

Initiator (faculty only)	Date	☐ Approved ☐ Disapproved Dean/Director of School/College	Date
Hannele Zubeck Initiator (TYPE NAME)			
☐ Approved ☐ Disapproved Department Chairperson	Date	☐ Approved ☐ Disapproved Undergraduate/Graduate Academic Board Chairperson	Date
☐ Approved ☐ Disapproved Curriculum Committee Chairperson	Date	☐ Approved ☐ Disapproved Provost or Designee	Date

UNIVERSITY OF ALASKA ANCHORAGE
COURSE CONTENT GUIDE

I. Initiation Date: February 20, 2014

II. Course Information

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

III. Course Activities

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

IV. Evaluation

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

V. Course Level Justification

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

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

VIII. Suggested Text

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

IX. Bibliography and Resources

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

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

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Biological Sciences

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
BIOL	A662	N/A	3	(3+0)

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with _____ Cross-Listed Coordination
☒ Stacked with BIOL A462 Signature

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

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1.		
2.		
3.		

Initiator Name (typed): Khrys Duddleston Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 6Jan14
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 6Jan14

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

15. Course Description *(suggested length 20 to 50 words)*
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.

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

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

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

16d. Registration Restriction(s) *(non-codable)*
Graduate 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) Date
Khrys Duddleston
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

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

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

University of Alaska Anchorage
College of Health
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:	A662
D. Number of Credits:	3
E. Contact Hours:	3+0
F. 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:

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

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

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

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Biological Sciences

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
BIOL	A462	N/A	3	(3+0)

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

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

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

If a change, mark appropriate boxes:

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

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

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

12. ☐ Cross Listed with _____
☒ Stacked with BIOL A662
Signature Cross-Listed Coordination

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

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1.		
2.		
3.		

Initiator Name (typed): Khrys Duddleston Initiator Signed Initials: _____ Date:_____

13b. Coordination Email 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 Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. 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.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
[BIOL A242 and BIOL A252] with minimum grade of C

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

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

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

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Changing pre-requisites to better reflect need for course.

Initiator (faculty only) Date
Khrys Duddleston
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

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

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

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

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

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