# Graduate Academic Board

Agenda

February 23, 2007
9:30 – 11:30 am
**ROOM CHANGE: ADM 143**

## I. Roll Call

| | | | |
|---|---|---|---|
| ( ) Jocelyn Krebs, Chair | ( ) George Mastroyanis | ( ) Terri Olson | ( ) Paula Williams- GSA |
| ( ) Alpana Desai | ( ) Nyree McDonald | ( ) Tim Hinterberger | ( ) Diane Erickson |
| ( ) Arlene Schmuland | ( ) Patricia Sandberg | ( ) Genie Babb | |
| ( ) Carlos Alsua | ( ) Peter Olsson | ( ) Tracey Burke | |

## II. Approval of Agenda (pg. 1-2)

## III. Approval of Meeting Summary – February 9, 2007 (pg. 3-5)

## IV. Administrative Reports

A. Vice Provost Tom Miller

B. Vice Provost for Research and Graduate Studies Doug Causey

## V. Chair's Report

A. GAB Chair – Jocelyn Krebs

B. Faculty Alliance - Tim Hinterberger

## VI. Program/Course Action Requests - Second Reading

**A. CAS**

| | | | |
|---|---|---|---|
| Chg | PSY | A624 | Group Therapy (3 cr) (3+0) |
| Chg | PSY | A626 | Family Therapy (3 cr) (3+0) |
| Chg | PSY | A631 | Cognitive Behavior Therapy (3 cr) (3+0) |
| Chg | PSY | A638 | Child Clinical Psychology (3 cr) (3+0) |
| Del | PSY | A643 | AIDS and Substance Abuse Counseling (3 cr) (3+0) |
| Del | PSY | A645 | Advanced Psychotherapy Skills (3 cr) (3+0) |
| Chg | PSY | A665 | Psychotherapy Practicum (1-3 cr) (2+10-20) |
| Del | PSY | A665A | Psychotherapy Practicum: Psychological Assessment (1 cr) (2+4) |
| Del | PSY | A665C | Psychotherapy Practicum Community Agency (1-3 cr) (2+4-12) |

| | | | |
|---|---|---|---|
| Chg | PSY | A670 | Psychotherapy Internship (3-6 cr) (2+20-40) |
| Del | PSY | A685L | Quantitative Methods in Psychology Lab (1 cr) (0+3) |
| Chg | PSY | A689 | Advanced Psychological Assessment (3 cr) (3+0) |
| Chg | PSY | A695 | Teaching Practicum in Psychology (3 cr) (2+8) |
| Chg | PSY | A698 | Individual Research (1-3 cr) (0+3-9) |

**No PSY revisions received**

## VII. Program/Course Action Request - First Reading

| | | | |
|---|---|---|---|
| Add | CE | A603 | Arctic Engineering (3 cr) (3+0) (stacked w/ CE A403) (pg. 6-14) |

## VIII. Old Business

A. 2006-2007 Goals

1. Course updates in preparation for 2010 visit
2. Graduate School task force

## IX. New Business

A. Box 9 Repeat Status

**Language from Curriculum Handbook**

Identifies the Repeat Status of the course.

Yes, means the course may be repeated for credit,

No, means it cannot be repeated for credit.

If repeat status is marked as Yes, the Number of Repeats and Maximum Hours must be indicated.

The Number of Repeats indicates the number of additional times the course may be taken for credit (does not include the original enrollment). The Maximum Hours indicates the total number of credits that may be applied towards a degree.

Example: HIST A390 3 credits
Repeat Status: Yes Number of Repeats: 1 Max Credits: 6

## X. Informational Items and Adjournment

A. Curriculum Log available on governance web site

B. Purge List now available online http://www.uaa.alaska.edu/governance/

# Graduate Academic Board

Summary

February 9, 2007
9:30 – 11:30 am
ADM 204

## I. Roll Call

| | | | |
|---|---|---|---|
| (x) Jocelyn Krebs, Chair | (x) George Mastroyanis | (x) Terri Olson | ( ) Paula Williams- GSA |
| ( ) Alpana Desai | (x) Nyree McDonald | ( ) Tim Hinterberger | (x) Diane Erickson |
| (x) Arlene Schmuland | (x) Patricia Sandberg | (x) Genie Babb | |
| ( ) Carlos Alsua | (x) Peter Olsson | (x) Tracey Burke | |

## II. Approval of Agenda (pg. 1-2)

**Approved**

## III. Approval of Meeting Summary – January 26, 2007 (pg. 3-5)

**Approved**

## IV. Administrative Reports

A. Vice Provost Tom Miller
Regents approved Bachelor Science in Construction Management

B. Vice Provost for Research and Graduate Studies Doug Causey

## V. Chair's Report

A. GAB Chair – Jocelyn Krebs
GSAT- finished first draft of constitution for graduate school
EBoard- passed resolution to have vote of support for Chancellor Maimon and requests that statewide try to retain her
Are also discussing faculty involvement in hire process

B. Faculty Alliance - Tim Hinterberger
Unable to attend

## VI. Program/Course Action Requests - Second Reading

**A. CBPP**

Add BA A699 Thesis (3 cr) (3+0) (pg. 6-10)
**Approved**

Chg Master of Business Administration (pg. 11-16)
**Approved**

## VII. Program/Course Action Request - First Reading

Chg Master of Science, Engineering Management (pg. 17-19)
**Waived first reading/ Approved for second reading**

Add CE A603 Arctic Engineering (3 cr) (3+0) (stacked w/ CE A403) (pg. 20-25)
**Tabled/ Initiator did not attend**

Chg PSY A624 Group Therapy (3 cr) (3+0) (pg. 26-28)

Chg PSY A626 Family Therapy (3 cr) (3+0) (pg. 29-32)

Chg PSY A631 Cognitive Behavior Therapy (3 cr) (3+0) (pg. 33-35)

Chg PSY A638 Child Clinical Psychology (3 cr) (3+0) (pg. 36-38)

Del PSY A643 AIDS and Substance Abuse Counseling (3 cr) (3+0) (pg. 39)

Del PSY A645 Advanced Psychotherapy Skills (3 cr) (3+0) (pg. 40)

Chg PSY A654 Cultural Issues in Psychotherapy (3 cr) (3+0) (pg. 41-43)
**PSY withdrew PSY A654**

Chg PSY A665 Psychotherapy Practicum (1-3 cr) (2+10-20) (pg. 44-47)

Del PSY A665A Psychotherapy Practicum: Psychological Assessment (1 cr) (2+4) (pg. 48)

Del PSY A665C Psychotherapy Practicum Community Agency (1-3 cr) (2+4-12) (pg.49)

Chg PSY A670 Psychotherapy Internship (3-6 cr) (2+20-40) (pg. 50-52)

Del PSY A685L Quantitative Methods in Psychology Lab (1 cr) (0+3) (pg. 53)

Chg PSY A689 Advanced Psychological Assessment (3 cr) (3+0) (pg. 54-56)

Chg PSY A695 Teaching Practicum in Psychology (3 cr) (2+8) (pg. 57-60)

Chg PSY A698 Individual Research (1-3 cr) (0+3-9) (pg. 61-64)

Chg M.S. Clinical Psychology (pg. 65-69)
**PSY withdrew M.S. Clinical Psychology**

**Approved all PSY courses (except for PSY A654 and MS Clinical Psychology)**

## VIII. Old Business

A. 2006-2007 Goals

1. Course updates in preparation for 2010 visit
2. Graduate School task force

## IX. New Business

### A. Provost Driscoll- Honors College Proposal (pg. 70-72)

Discussions about Honors College have been occurring for a while
**Budget concerns-**
Budget proposal will first go through Provost Office, then PBAC
Goals:
To serve more students

Keep Honors deficit from getting bigger
Still have negative number to clean up, but trying not to make number larger
**Faculty involvement-**
Previous payback to department solution was only a band aid
Departments have their work and deans have responsibility over that
Need to be more communication and clearer lines
Appropriate to have clearly recognized unit that we can go to for Honors
Concern- this is something that has grown in ad hoc fashion. How is honors program connected to curriculum process? Would it feed into UAB, with a Dean leading the program. GAB may have interest in research portion.

Core Honors Program (general education replacement)
Departmental Honors Options

Provost is not looking at hiring faculty to be only honors faculty
This step is in line with principles and practices for accreditation visits
Could send accreditors an informational letter regarding Honors Program (more info would be sent upon request)
Honors College will be discussed with SAC
Honors College does not need GAB or UAB approval, only viewing as informational item

Not in academic college, has nothing in there about curriculum approval
Limitations to keeping Honors in several separate colleges
Entity at this level could generate more funds and give prestige to university

## X. Informational Items and Adjournment

A. Curriculum Log available on governance web site

B. Purge List now available online http://www.uaa.alaska.edu/governance/

**Meeting Adjourned**
**Item for March agenda: Discussion of Box 9 need to occur**

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

| 1a. School or College | 1b. Division | 1c. Department |
|---|---|---|
| EN SOENGR | | Civil Engineering |

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

6. Complete Course/Program Title
Arctic Engineering

Abbreviated Title for Transcript (30 character)

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

8. Type of Action ☒ Course ☐ Program

☐ Add
☒ Change
(mark appropriate boxes)
☐ Delete

☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Other Restrictions
☐ Class ☐ Level
☐ College ☐ Major
☐ Other

☐ Course Number
☐ Contact Hours
☐ Repeat Status
☒ Cross-Listed/Stacked
☐ Course Prerequisites
☐ Co-requisites
☐ Registration Restrictions

9. Repeat Status No # of Repeats 0 Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2007 To: 99/9999

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

☒ Stacked with CE A403

13. List any programs or college requirements that require this course
MS Arctic Engineering

14. Coordinate with Affected Units: N/A
Department, School, or College

_____
Initiator Signature Date

15. ☐ General Education Requirement ☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities ☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

16. Course Description
Introduces students to a broad spectrum of engineering challenges unique to cold regions. Physical principles and practical data collection methods, analyses, designs, and construction methods are discussed. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.

| 17a. Course Prerequisite(s) (list prefix and number) | 17b. Test Score(s) | 17c. Co-requisite(s) (concurrent enrollment required) |
|---|---|---|
| | | |

17d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

17e. Registration Restriction(s) (non-codable)
Graduate standing with a baccalaureate degree in engineering

18. ☐ Mark if course has fees

19. Justification for Action
The Bachelor of Science program in Civil Engineering pledges in its catalog introduction that "The UAA Civil Engineering program emphasizes northern region design considerations and provides specialized training appropriate for an engineering career in Alaska and other cold regions of the world." This required course at the undergraduate (CE A403) will assure that this pledge is met. The graduate level course (CE A603) is distinguished by the requirement for preparation of a scholarly paper, whose presentation will benefit undergraduate students.

_____
Initiator (faculty only) Date

____ Approved
____ Disapproved: _____
Department Chairperson Date

____ Approved
____ Disapproved: _____
Curriculum Committee Chairperson Date

____ Approved
____ Disapproved: _____
Dean/Director of School/College Date

____ Approved
____ Disapproved: _____
Undergraduate or Graduate Academic Board Chairperson Date

____ Approved
____ Disapproved: _____
Provost or Designee Date

**COURSE CONTENT GUIDE**
**University of Alaska Anchorage, School of Engineering**

**CE A603 Arctic Engineering**

**Date initiated:** 2/21/07 **Date revised:**

**Course title**: Arctic Engineering **Course number**: CE A603

**Credits**: 3.0 **CEU's**: N/A **Course duration**: 15 week semester

**Contact hours**: Information in the format of narrated slide presentations, short videos, and other online study aids are presented weekly, each requiring an average two hours to review. Required online guided discussions and other interactions with the instructor and fellow students require at least an additional one hour weekly, for 3.0 hours per week or 3 hours/week * 15 weeks = 45 hours total contact-equivalent student learning time.

**Programs**: Arctic Engineering **Grading basis**: A - F

**Course Description**: Introduces students to a broad spectrum of engineering challenges unique to cold regions. Physical principles and practical data collection methods, analyses, designs, and construction methods are discussed. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.

**Course registration restrictions**:
CE A603: Graduate standing with a baccalaureate degree in engineering

**Course prerequisites**: NA

**Fee amount**: $38 (or current UAA distance delivery fee)

## I. Instructional Goals and Student Outcomes.

A. **Instructional Goals**: Instructors will present materials, lead discussions, and assign exercises intended to give senior and graduate engineering students an ability to analyze and apply climatic data, an understanding of the effects of cold temperatures, snow, ice and frozen ground on the design, maintenance and operation of engineered infrastructure, and knowledge of specialized construction issues in the arctic.

B. **Student Outcomes**: On successful completion of the course, students will:

1. Understand physical reasons for climate variations
2. Know basic principles of heat transfer and have the ability to perform associated computations

3. Know the basic characteristics of ice and snow and the nature of their effects on engineering infrastructure
4. Understand fundamental aspects of freezing ground and associated effects on foundations and roads
5. Understand basic principles and practices of building design and construction in the presence of freezing temperatures and snow
6. Understand requirements for utilities that are unique to cold regions of the world
7. Understand critical aspects of construction, winter safety, and emergency survival in the Arctic
8. Have a basic understanding of psychrometric charts and of moisture migration in Arctic structures
9. Know of critical issues related to electrical engineering in the Arctic
10. Demonstrated skill for self-directed written research on Arctic Engineering issues

## II. Guidelines for evaluation

A. **Individual participation in discussions**: Students are required to participate in instructor-directed online discussion of course topics and are otherwise encouraged to interact with each other in a scholarly manner regarding the challenges of learning modules in the course.

B. **Homework assignments:** Students are required to retrieve and interpret data and other information and to perform computations associated with topics of the course learning modules.

C. **Midterm and Final Exams**: A midterm exam and a comprehensive final exam are administered online. Students are required to explicitly vouch for their academic honesty on the exam.

D. **Term Research Project and Report**: Students complete a research project and author a paper. The topic of the paper must directly involve cold regions engineering by discussing effects of freezing temperatures, snow, ice, permafrost or other aspects unique to the Arctic on the design, construction, operation, or maintenance of engineering works.

## III. Course level justification

A. The primary context of the course is discussion among professional peers on advanced technical topics, with the basic assumption that students are accustomed to this level of interaction.

B. Presentations and reading by students include advanced scientific and engineering topics requiring a background in math and science equivalent to

that of the senior year in bachelor's degree programs in engineering for correct interpretation.

C. Significant responsibility for independent critical thinking, efficient learning habits, and interpretation of technical information falls on the student at a level commonly associated with upper-class undergraduate and graduate education.

D. The requirement for a self-directed written research project requires abilities to analyze data, to evaluate models used in research, and to draw independent conclusions at a level beyond that typically required in undergraduate education.

## IV. Topical course outline

A. Global Perspectives – climate and seasonal variations on Earth, heat balance of Earth and its atmosphere, long-term climate change
B. Heat Transfer – conduction, convection and radiation
C. Ice Engineering – properties of ice, introduction to sea, lake and river ice, challenges relating to ice
D. Snow Engineering – snow distribution, measurements and properties
E. Frozen Ground Engineering – review of soil properties, properties and behavior of frozen soils
F. Arctic Roads – challenges due to cold environment on roads and airfields, selection of proper construction materials, design and construction considerations
G. Arctic Buildings – site selection, design of roof, walls, floor and utilities, snow management
H. Arctic Utilities – introduction to water and wastewater systems, planning and project development
I. Arctic Construction – introduction to construction conditions and techniques in the arctic environment
J. Winter Safety and Survival – wind chill charts, survival tips, understanding of risk to hypothermia and frost bites
K. Mechanical Engineering Issues in Cold Regions – Psychrometrics, heating loads, moisture migration in structures
L. Electrical Engineering Issues in Cold Regions – Introduction to power generation, communications, instrumentation and corrosion prevention in cold climates
M. Term paper conference; reading and discussion of student papers

## V. Suggested text and bibliography

A. **Suggested text.** No suggested text. References are drawn from the professional literature and equivalent online sources of technical information.

## B. Bibliography

1. AIA Alaska, 2004. Northern Building Design, American Institute of Architects, Anchorage
2. Eranti, E., and Lee, G., 2000. Cold Region Structural Engineering, McGraw-Hill
3. McFadden, T., and Bennett, F., 1991. Construction in Cold Regions – A Guide for Planners, Engineers, Contractors, and Managers, John Wiley & Sons, Inc., NY.
4. O. Andersland and B. Ladanyi. 2004. Frozen Ground Engineering, ASCE, Wiley.
5. Smith, D. W., ed., 1996. Cold Regions Utilities Monograph, 3rd ed., Technical Council on Cold Regions Engineering Monograph, American Society of Civil Engineers
6. Rice, Eb, 1996. Building in the North, University of Alaska

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

| 1a. School or College | 1b. Division | 1c. Department |
|---|---|---|
| EN SOENGR | | Civil Engineering |

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

6. Complete Course/Program Title
Arctic Engineering

Abbreviated Title for Transcript (30 character)

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

8. Type of Action ☒ Course ☐ Program

☒ Add
☐ Change
(mark appropriate boxes)
☐ Delete

☐ Prefix
☐ Credits
☐ Title
☐ Grading Basis
☐ Course Description
☐ Test Score Prerequisites
☐ Other Restrictions
☐ Class ☐ Level
☐ College ☐ Major
☐ Other

☐ Course Number
☐ Contact Hours
☐ Repeat Status
☐ Cross-Listed/Stacked
☐ Course Prerequisites
☐ Co-requisites
☐ Registration Restrictions

9. Repeat Status No # of Repeats 0 Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2007 To: 99/9999

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

☒ Stacked with CE A603

13. List any programs or college requirements that require this course
BS Civil Engineering

14. Coordinate with Affected Units: N/A
Department, School, or College

_____
Initiator Signature Date

15. ☐ General Education Requirement ☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities ☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

16. Course Description
Introduces students to a broad spectrum of engineering challenges unique to cold regions. Physical principles and practical data collection methods, analyses, designs, and construction methods are discussed. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.

| 17a. Course Prerequisite(s) (list prefix and number) | 17b. Test Score(s) | 17c. Co-requisite(s) (concurrent enrollment required) |
|---|---|---|
| | | |

17d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

17e. Registration Restriction(s) (non-codable)
Upper class standing in an accredited undergraduate program in engineering

18. ☐ Mark if course has fees

19. Justification for Action
The Bachelor of Science program in Civil Engineering pledges in its catalog introduction that "The UAA Civil Engineering program emphasizes northern region design considerations and provides specialized training appropriate for an engineering career in Alaska and other cold regions of the world." This required course will assure that this pledge is met for each UAA BSCE graduate and furthermore provide them with an essential credential for Professional Engineer licensure in Alaska (pending review and approval by the Alaska Board of Registration following creation of CE A403).

_____
Initiator (faculty only) Date

____ Approved
____ Disapproved: _____
Department Chairperson Date

____ Approved
____ Disapproved: _____
Curriculum Committee Chairperson Date

____ Approved
____ Disapproved: _____
Dean/Director of School/College Date

____ Approved
____ Disapproved: _____
Undergraduate or Graduate Academic Board Chairperson Date

____ Approved
____ Disapproved: _____
Provost or Designee Date

**COURSE CONTENT GUIDE**
**University of Alaska Anchorage, School of Engineering**

**CE A403 Arctic Engineering**

**Date initiated:** 2/21/07 **Date revised:**

**Course title**: Arctic Engineering **Course number**: CE A403

**Credits**: 3.0 **CEU's**: N/A **Course duration**: 15 week semester

**Contact hours**: Information in the format of narrated slide presentations, short videos, and other online study aids are presented weekly, each requiring an average two hours to review. Required online guided discussions and other interactions with the instructor and fellow students require at least an additional one hour weekly, for 3.0 hours per week or 3 hours/week * 15 weeks = 45 hours total contact-equivalent student learning time.

**Programs**: Arctic and Civil Engineering **Grading basis**: A - F

**Course Description**: Introduces students to a broad spectrum of engineering challenges unique to cold regions. Physical principles and practical data collection methods, analyses, designs, and construction methods are discussed. Students gain a working knowledge of cold regions engineering problems and modern solutions as a basis for more detailed study.

**Course registration restrictions**:
CE A403: Upper class standing in an accredited undergraduate program in engineering

**Course prerequisites**: NA

**Fee amount**: $38 (or current UAA distance delivery fee)

## I. Instructional Goals and Student Outcomes.

A. **Instructional Goals**: Instructors will present materials, lead discussions, and assign exercises intended to give senior and graduate engineering students an ability to analyze and apply climatic data, an understanding of the effects of cold temperatures, snow, ice and frozen ground on the design, maintenance and operation of engineered infrastructure, and knowledge of specialized construction issues in the arctic.

B. **Student Outcomes**: On successful completion of the course, students will:

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5. Understand basic principles and practices of building design and construction in the presence of freezing temperatures and snow
6. Understand requirements for utilities that are unique to cold regions of the world
7. Understand critical aspects of construction, winter safety, and emergency survival in the Arctic
8. Have a basic understanding of psychrometric charts and of moisture migration in Arctic structures
9. Know of critical issues related to electrical engineering in the Arctic

## II. Guidelines for evaluation

A. **Individual participation in discussions**: Students are required to participate in instructor-directed online discussion of course topics and are otherwise encouraged to interact with each other in a scholarly manner regarding the challenges of learning modules in the course.

B. **Homework assignments:** Students are required to retrieve and interpret data and other information and to perform computations associated with topics of the course learning modules.

C. **Midterm and Final Exams**: A midterm exam and a comprehensive final exam are administered online. Students are required to explicitly vouch for their academic honesty on the exam.

## III. Course level justification

A. The primary context of the course is discussion among professional peers on advanced technical topics, with the basic assumption that students are accustomed to this level of interaction.

B. Presentations and reading by students include advanced scientific and engineering topics requiring a background in math and science equivalent to that of the senior year in bachelor's degree programs in engineering for correct interpretation.

C. Significant responsibility for independent critical thinking, efficient learning habits, and interpretation of technical information falls on the student at a level commonly associated with upper-class undergraduate and graduate education.

## IV. Topical course outline

A. Global Perspectives – climate and seasonal variations on Earth, heat balance of Earth and its atmosphere, long-term climate change
B. Heat Transfer – conduction, convection and radiation
C. Ice Engineering – properties of ice, introduction to sea, lake and river ice, challenges relating to ice
D. Snow Engineering – snow distribution, measurements and properties
E. Frozen Ground Engineering – review of soil properties, properties and behavior of frozen soils
F. Arctic Roads – challenges due to cold environment on roads and airfields, selection of proper construction materials, design and construction considerations
G. Arctic Buildings – site selection, design of roof, walls, floor and utilities, snow management
H. Arctic Utilities – introduction to water and wastewater systems, planning and project development
I. Arctic Construction – introduction to construction conditions and techniques in the arctic environment
J. Winter Safety and Survival – wind chill charts, survival tips, understanding of risk to hypothermia and frost bites
K. Mechanical Engineering Issues in Cold Regions – Psychrometrics, heating loads, moisture migration in structures
L. Electrical Engineering Issues in Cold Regions – Introduction to power generation, communications, instrumentation and corrosion prevention in cold climates

## V. Suggested text and bibliography

A. **Suggested text.** No suggested text. References are drawn from the professional literature and equivalent online sources of technical information.

**B. Bibliography**

1. AIA Alaska, 2004. Northern Building Design, American Institute of Architects, Anchorage
2. Eranti, E., and Lee, G., 2000. Cold Region Structural Engineering, McGraw-Hill
3. McFadden, T., and Bennett, F., 1991. Construction in Cold Regions – A Guide for Planners, Engineers, Contractors, and Managers, John Wiley & Sons, Inc., NY.
4. O. Andersland and B. Ladanyi. 2004. Frozen Ground Engineering, ASCE, Wiley.
5. Smith, D. W., ed., 1996. Cold Regions Utilities Monograph, 3rd ed., Technical Council on Cold Regions Engineering Monograph, American Society of Civil Engineers
6. Rice, Eb, 1996. Building in the North, University of Alaska