

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	CRCD Department of Science	College/School	CRCD
Prepared by	Tom Marsik	Phone	842-5109
Email Contact	tmarsik@alaska.edu	Faculty Contact	same

See <http://www.uaf.edu/uafgov/faculty/cd/cdman.html> for a complete description of the rules governing curriculum & course changes.

1. ACTION DESIRED (check one): Trial Course New Course

2. COURSE IDENTIFICATION: Dept Course # No. of Credits

Justify upper/lower division status & number of credits:	<p>This course is designed to serve as a course in the Environmental Studies (ENVI) Certificate program and Renewable Resources (RR) A.A.S. degree program. These programs focus on delivering quality entry-level coursework relevant to rural Alaska students with the goal of skill set development in the field of environmental sciences and renewable resources. This course focuses on energy use and production in society and its environmental impacts, which are ever growing concerns.</p> <p>ENVI 220 requires basic knowledge of math that students typically gain during their first year. The course has three contact hours per week.</p>
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3. PROPOSED COURSE TITLE

4. CROSSLISTED? YES/NO If yes, Dept: Course #
(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. STACKED? YES/NO If yes, Dept. Course #

6. FREQUENCY OF OFFERING:
(Every or Alternate) Fall, Spring, Summer — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (if approved)

8. COURSE FORMAT:

NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

COURSE FORMAT: (check one)	<input type="checkbox"/>	1	<input type="checkbox"/>	2	<input type="checkbox"/>	3	<input type="checkbox"/>	4	<input type="checkbox"/>	5	<input checked="" type="checkbox"/>	6 weeks to full semester
OTHER FORMAT (specify)												
Mode of delivery (specify lecture, field trips, labs, etc)	lectures + seminars + independent projects											

9. CONTACT HOURS PER WEEK: LECTURE hours/weeks LAB hours/week PRACTICUM hours/week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See <http://www.uaf.edu/uafgov/faculty/cd/credits.html> for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

ENVI 220 – Intro to Sustainable Energy (3 cr) - Introduction to societal problems and solutions related to its energy use and production. Problems discussed are mainly related to the extent of sustainability of current energy practices. Solutions discussed cover both areas – energy efficiency and renewable energy.

11. **COURSE CLASSIFICATIONS** (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities N = Natural Science S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? YES NO

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6 W = Writing Intensive, Format 7 Natural Science, Format 8

12. **COURSE REPEATABILITY:**

Is this course repeatable for credit? YES NO

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit? TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

13. **GRADING SYSTEM:**

LETTER: PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

14. **PREREQUISITES** Any 100 level MATH course; or permission of instructor

These will be *required* before the student is allowed to enroll in the course.

RECOMMENDED none

Classes, etc. that student is strongly encouraged to complete prior to this course.

15. **SPECIAL RESTRICTIONS, CONDITIONS**

16. **PROPOSED COURSE FEES**

\$0

Has a memo been submitted through your dean to the Provost & VCAS for fee approval? Yes/No

17. **PREVIOUS HISTORY**

Has the course been offered as special topics or trial course previously? Yes/No

Yes

If yes, give semester, year, course #, etc.:

Spring 2010 - ENVI 293 - Intro to Sustainable Energy

18. **ESTIMATED IMPACT**

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

This is a distance-delivered three-credit course with no lab, thus it should have minimal influence on budget, facility, and space resources. Faculty has been hired to teach this course.

Students will attend the course via E-Live sessions, Blackboard, and email. This can be done from any computer with sufficient internet connection. No new facilities or space will be required.

This course will broaden courses and topics in the ENVI and RR programs. This program enhancement should attract more students and help prepare students for higher degree studies or entry-level employment in the environmental studies and renewable resources fields.

This course will also broaden the spectrum of UAF courses in the area of sustainable energy, which is a field of quickly growing importance, and can serve as one of the courses for a potential Occupational Endorsement in Sustainable Energy. Sustainable energy is a high demand field across Alaska with a lot of potential for growth.

19. **LIBRARY COLLECTIONS**

Have you contacted the library collection development officer (ffkj@uaf.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No

Yes

September 16, 2010 - No resource impact.

20. IMPACTS ON PROGRAMS/DEPTS

*What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)*

ENVI and RR:

This course will have a positive impact on the ENVI and RR programs as it will broaden the courses and topics offered. This should attract more students into these programs. The impact was many times discussed in person and via email with Dr. Todd Radenbaugh, the academic director of these programs, who is very supportive of this new course offering.

Electrical Engineering (EE):

The topics of sustainable energy are also discussed in the Power and Control branch of the Electrical Engineering B.S. program. The impact of this new course was discussed via phone and email with Dr. Richard Wies, who is the head of the Power and Control branch, and he supports this new course. Getting rural students excited about energy and engineering at a lower-level increases their interest to pursue a B.S., or even M.S., at the College of Engineering and Mines at UAF.

21. POSITIVE AND NEGATIVE IMPACTS

*Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.*

Besides the impacts stated above (Section 20.), this course will also benefit non-degree students interested in sustainable energy.

No significant negative impacts are anticipated.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

Residents of rural Alaska are facing challenges with respect to the cost of home energy as well as environmental and social sustainability of current practices. They are seeking education to both deal with their personal issues related to energy and follow careers in the energy and environmental fields. This course will help satisfy that demand.

This course will serve as a course in the ENVI Certificate program and RR A.A.S. degree program, which will broaden and enhance the topics covered by these and other programs, which in turn will attract more students.

UAF Bristol Bay Campus has the experience in environmental science with focus on sustainable energy, as demonstrated by the newly established Sustainable Energy Initiative, headed by Dr. Tom Marsik.

APPROVALS

	Date	
Signature, Chair, Program/Department of:		

	Date	
Signature, Division Chair CRCD of:		

	Date	
Signature, Chair, College/School Curriculum Council for:		

	Date	
Signature, Dean, College/School of:		

	Date	
Signature of Provost (if applicable)		
Offerings above the level of approved programs must be approved in advance by the Provost.		

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

	Date	
Signature, Chair, UAF Faculty Senate Curriculum Review Committee		

ADDITIONAL SIGNATURES (If required)

	Date	
Signature, Chair, Program/Department of:		

	Date	
Signature, Chair, College/School Curriculum Council for:		

	Date	
Signature, Dean, College/School of:		

ATTACH COMPLETE SYLLABUS (as part of this application).

Note: syllabus must follow the guidelines discussed in the Faculty Senate Guide <http://www.uaf.edu/uafgov/faculty/cd/syllabus.html>. The department and campus wide curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course change will be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES

During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. Course information:

Title, number, credits, prerequisites, location, meeting time
(make sure that contact hours are in line with credits).

2. Instructor (and if applicable, Teaching Assistant) information:

Name, office location, office hours, telephone, email address.

3. Course readings/materials:

Course textbook title, author, edition/publisher.
 Supplementary readings (indicate whether required or recommended) and
 any supplies required.

4. Course description:

Content of the course and how it fits into the broader curriculum;
 Expected proficiencies required to undertake the course, if applicable.
 Inclusion of catalog description is *strongly* recommended, and
 Description in syllabus must be consistent with catalog course description.

5. Course Goals (general) and Student Learning Outcomes (more specific)

6. Instructional methods:

Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

7. Course calendar:

A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

8. Course policies:

Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

9. Evaluation:

Specify how students will be evaluated, what factors will be included, their relative value, and
 how they will be tabulated into grades (on a curve, absolute scores, etc.)

10. Support Services:

Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

11. Disabilities Services:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials.

State that you will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities."

ENVI 220 - Intro to Sustainable Energy

Term:	Spring 2011
Course Title:	Intro to Sustainable Energy
Dept. & Num:	ENVI 220
Credits:	3
Prerequisites:	Any 100 level MATH course; or permission of instructor
Dates:	Spring 2011 – all semester
Days and Times:	Tuesday, Thursday 6:50-8:20pm
Location:	Online; Distance-delivered from UAF BBC

Instructor:	Dr. Tom Marsik
Office Location:	UAF Bristol Bay Campus, Room 117
Position:	Assistant Professor
Phone:	842-5109
Fax:	842-5692
Email:	tmarsik@alaska.edu
Hours Available:	By Appt.

Text:	David J.C. MacKay. Sustainable Energy – without the hot air. UIT Cambridge, 2008. ISBN 978-0-9544529-3-3. Available free online from www.withouthotair.com
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Course Description:

Introduction to societal problems and solutions related to its energy use and production. Problems discussed are mainly related to the extent of sustainability of current energy practices. Solutions discussed cover both areas – energy efficiency and renewable energy. Students actively participate via presentations in seminar sessions and independent projects dealing with real-life issues.

Course Goals:

The general goals of this course are to provide education that will help students analyze problems with various practices of energy production and use, and to evaluate the feasibility of possible solutions to these problems.

Student Learning Outcomes:

Upon successful completion of this course, the student will be able to:

- Recognize basic science concepts related to energy.
- Perform basic analysis of energy systems (electricity, space heating, transportation)
- Explain problems with current energy practices
- Discuss economic aspects of sustainable energy
- Describe possible solutions to current energy problems
- Distinguish between energy efficiency and renewable energy approaches to the fossil fuel use reduction
- Review literature and compile information related to sustainable energy
- Demonstrate presentation skills regarding sustainable energy
- Apply the knowledge gained in the course to small real-life energy management issues

Instructional Methods:

E-live/teleconference lectures and seminar sessions are closely integrated with homework exercises and independent projects. Email and Blackboard are used for off-class communication, sharing material, and exams.

Course Calendar:

See attached.

Course Policies:

1. UAF requires students to conduct themselves honestly and responsibly, and to respect the rights of others.
2. You are expected to attend and actively participate in all lectures and seminars.
3. Homework will be assigned each Tuesday and due at the beginning of class the following Tuesday. You are encouraged to discuss homework questions with your peers, but you are not allowed to copy.
4. Late assignments will not be accepted without prior approval of instructor.
5. Student presentations must be delivered when scheduled.
6. Project reports are due on April 19, 2011. Late reports will not be accepted.
7. The instructor reserves the right to amend this course outline as needed.

Evaluation:

Final grades are calculated from the points earned in the following areas:

Attendance and Participation	10%
Students are expected to attend and actively participate in all classroom sessions.	
Homework	10%
It will consist of problems and questions related to recently covered material in lectures (see the attached tentative schedule for lecture topics). It will be assigned each Tuesday and due at the beginning of class the following Tuesday.	
Presentations in seminar sessions	25%
Every student will deliver a 20-25 min presentation followed by a 10-15 min discussion. The presentation is based on a literature review of a topic of student’s choice related to sustainable energy.	
Independent projects	25%
Every student is required to spend 10-20 hours on an independent project dealing with a real-life energy management issue, submit a 3-5 page report, and deliver a 10 min presentation.	
Midterm Exam	10%
Midterm exam will be open book, open notes, and will be taken via Blackboard. It will cover all material covered up to that point.	
Final Exam	20%
Final exam will be open book, open notes, and will be taken via Blackboard. It will cover all material from the whole semester.	

Grading Policy:

Letter Grades

A+	96.7 – 100%
A	93.3 – 96.7%
A-	90.0 – 93.3%
B+	86.7 – 90.0%
B	83.3 – 86.7%
B-	80.0 – 83.3%
C+	76.7 – 80.0%
C	73.3 – 76.7%
C-	70.0 – 73.3%
D+	66.7 – 70.0%
D	63.3 – 66.7%
D-	60.0 – 63.3%
F	Below 60%

Support and Disability Services:

University of Alaska Fairbanks
Bristol Bay Campus – Student Services

PO Box 1070
Dillingham, Alaska 99576
907-842-5109
800-478-5109
Fax: 907-842-5692

Students can also go to the UAF website <http://www.uaf.edu> or to the College of Rural and Community Development website <http://www.uaf.edu/rural/> or to Bristol Bay Campus website <http://www.uaf.edu/bbc/index.html>.

UAF Disability Services for Distance Students

UAF has a Disability Services office that operates in conjunction with the College of Rural and Community Development (CRCDD) campuses and UAF's Center for Distance Education (CDE). Disability Services, a part of UAF's Center for Health and Counseling, provides academic accommodations to enrolled students who are identified as being eligible for these services. If you believe you are eligible, please visit <http://www.uaf.edu/chc/disability.html> on the web or contact a student affairs staff person at your nearest local campus. You can also contact Disability Services on the Fairbanks Campus at (907) 474-7043, fydso@uaf.edu

ENVI 220 – Intro to Sustainable Energy - Tentative Schedule - Spring 2011

All dates and topics are tentative and subject to change.

Tuesday	Thursday
18-Jan Course Introduction Session 1	20-Jan Discussion of topics for student presentations and projects <i>Reading assignment: pages 2 - 21</i> Session 2
25-Jan Basic intro to sustainable energy; Divide presentation topics; Lecture on presenting Session 3	27-Jan Guest speaker Ashish Agrawal – Sustainable energy projects at Fort Wainwright, Fairbanks Session 4
1-Feb Divide project topics Sample student presentation (Tom Marsik) Session 5	3-Feb Energy efficiency vs. renewable energy; Electricity – basic physics <i>Reading assignment: pages 22 - 28</i> Session 6
8-Feb Student presentations + discussions Session 7	10-Feb Heat – basic physics <i>Reading assignments: pages 50 - 54</i> Session 8
15-Feb Student presentations + discussions Session 9	17-Feb Economic analysis; Life cycle Session 10
22-Feb Review for midterm Session 11	24-Feb Lighting; <i>Reading assignment: pages 57 – 59; 155 - 156</i> Session 12
1-Mar Midterm Session 13	3-Mar Lighting – Cont'd Session 14
8-Mar Student project updates Session 15	10-Mar Green buildings; Energy and indoor air quality; Insulation <i>Reading assignment: pages 140 - 154</i> Session 16
15-Mar Spring break	17-Mar Spring break
22-Mar Student presentations + discussions Session 17	24-Mar Intro to renewable energy Session 18
29-Mar Student presentations + discussions Session 19	31-Mar Solar energy <i>Reading assignment: pages 38 – 49</i> Session 20
5-Apr Student presentations + discussions Session 21	7-Apr Guest speaker Brian Hirsch, NREL - biomass Session 22
12-Apr Student presentations + discussions Session 23	14-Apr Wind energy <i>Reading assignment: pages 263 - 268</i> Session 24

19-Apr Project presentations; All project reports due	Session 25	21-Apr Project presentations	Session 26
26-Apr Geothermal, Tidal	Session 27	28-Apr Review for final exam	Session 28

Ideas for student presentations (first on list) and projects (last on list) include, but are not limited to:

- LED lighting – presence and perspective for future
- Induction lighting - presence and perspective for future (<http://uslightingtech.com/>)
- High-efficiency organic photovoltaic materials
- Energy payback of photovoltaic panels – in Alaska and generally
- Energy payback of solar-hot-water panels – in Alaska and generally
- Energy payback of wind turbines
- Super capacitors for electrical energy storage – presence and perspective for future
- New battery technologies (e.g. lithium, flow batteries, etc.)
- Hybrid and electric cars – environmental impact of batteries
- Fast growing biomass in Alaska – perspectives for future
- Diesel vs. gasoline engines – efficiency, emissions, cold-climate operation, etc.
- Biodiesel from algae – presence and perspective for future
- Biodiesel and increased NOx emissions – does it outweigh the benefits?
- Modern airships – perspective solution for energy efficient long-distance transport?
- Magnetic couplings (<http://www.magnadrive.com/>)
- Payback of low rolling resistance tires?
- Flying vs. driving – which one is worse?
- CO2 emissions from 1kWh of electricity consumed in your area?
- Fluorescent lamps – switch them off (and thus reduce lifespan) or leave them on?
- Health effects of mercury gas in broken fluorescent bulbs (thrown in trashcan)
- Locally grown food – always better than imported food?
- Feasibility of upgrading outdoor/indoor lighting at UA campuses (LED?, induction?, fluorescent?)
- Feasibility of better control of outdoor/indoor lighting at UA campuses
- Feasibility of other lighting upgrades at UA campuses (better fixtures?, remove lights in overlit areas?)
- Feasibility of better control of headbolt outlets at UA campuses
- How much does a blanket over a hood help reduce electricity needed for plugging in vehicles?
- Honors house retrofit (design PV system, insulation, solar hot water collectors, ...)
- Feasibility of putting computers on UA campuses in sleep mode?
- Feasibility of using VendMisers for the vending machine power control on UA campuses.
- Feasibility of energy efficiency upgrades in students' homes.
- Contribute to Alaska Energy Wiki (<http://www.energy-alaska.com/>) (e.g. regional project inventory)
- Contribute to the energy section of the Dillingham Comprehensive Plan update.
- Contribute to the Wind for Schools program as part of a University Wind Working Group.
- Label all light switches at UAF showing annual cost and CO2 emissions if they are left on.
- Do a survey of households in Dillingham – breakdown of their energy cost by heat, electricity, etc.