FORMAT 1

Submit original with signatures + 1 copy + electronic copy to UAF Governance.

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

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY: **Department**	Biology and Wildlife	**College/ School**	CNSM
Prepared by	Mary Beth Leigh	**Phone**	6656
Email Contact	mbleigh@alaska.edu		Mary Beth Leigh

1. ACTION DESIRED ***(CHECK ONE):*** Trial Course [ ] New Course [X]

2. COURSE IDENTIFICATION: Dept: BIOL | Course #: ~~4XX/6XX~~ TBD | No. of Credits: 3

Justify upper/lower division status & number of credits:

3. PROPOSED COURSE TITLE: Environmental Microbiology

4. To be CROSS LISTED? ***YES/NO*** ~~Yes~~ No | If yes, Dept: ~~CHEM/ENVE~~ | Course #: 6XX

No cross-list with CHEM. 11/11/11

11/15/'11: No ENVE cross-listing.

(Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. To be STACKED? ***YES/NO*** Yes | If yes, Dept. BIOL | Course # 4XX/6XX

6. FREQUENCY OF OFFERING: Fall

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING (if approved) Fall 2011

RECEIVED

OCT – 6 2011

Governance

10/7/11 KQ

Dean's Office

College of Natural Science & Mathematics

12. COURSE REPEATABILITY:

Is this course repeatable for credit?	YES		NO	X

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: Specify only one.

LETTER:	X	PASS/FAIL:	

RESTRICTIONS ON ENROLLMENT (if any)

14. PREREQUISITES	BIOL 115/116 (Fundamentals of Biology), BIOL 342 (Microbiology) and CHEM 105/106 (General Chemistry) or equivalent, or permission of instructor

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

RECOMMENDED	Chem 451 or Biol 303 (Biochemistry) or equivalent

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

15. SPECIAL RESTRICTIONS, CONDITIONS	

16. PROPOSED COURSE FEES	$

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.:	Fall 2007, Fall 2008, Fall 2010 as BIOL 494/694 Environmental Microbiology

18. ESTIMATED IMPACT

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

This course requires a classroom that seats up to 16 students. Since this has been taught 3 times, it should not alter the usual workload of the faculty instructor.

19. LIBRARY COLLECTIONS

Have you contacted the library collection development officer (kljensen@alaska.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	X		

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)

Biology and Wildlife: This course will provide a new upper level, written-intensive (W) BIOL elective for undergraduate Biology majors. There is a departmental need for more W courses to meet undergraduate demand. Graduate students in biology whose research involves microbiology and/or ecology will find it valuable for their graduate study plans.

Department of Chemistry and Biochemistry: Graduate students pursuing the M.S. in Environmental Chemistry with emphasis on toxicology can use this course as an approved elective. Undergraduates in various chemistry degree programs may use the course to as an elective.

Department of Civil and Environmental Engineering: Graduate students pursuing their M.S. in Environmental Engineering can use this course to fulfill the required course in biotechnology (in place of ENVE F647).

21. POSITIVE AND NEGATIVE IMPACTS

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

Positive impacts: Students in Biology, Environmental Chemistry and Environmental Engineering programs will have a new course option to fulfill requirements and/or electives, including a requirement for a W (written-intensive) course. The integrative nature of this class will promote interdepartmental interaction and prepare students for interdisciplinary careers in the environmental science field.

Negative impacts: This class may result in fewer students enrolling in ENVE F647, sine it serves as on approved replacement. However, this policy has been in place since Environmental Microbiology was offered in 2008 (when ENVE F647 was canceled due to instructor medical leave) and to my knowledge this has not resulted in ENVE F647 being canceled due to low enrollment.

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.

This course has been offered 3 times as a stacked trial course (BIOL 494/64) in Fall 2007, 2008 and 2010 to class sizes ranging from 8-15 students. In 2007, the enrollment included only Biology graduate and undergraduate students, but starting in 2008 began drawing substantial enrollment from the Environmental Engineering M.S. program, as well as students from the Environmental Chemistry M.S. program, undergraduates and exchange students majoring in Chemistry, and a graduate student from the School of Fisheries and Ocean Sciences, as well as Biology graduate and undergraduate students. There was only one semester (Fall 2009) when the class was canceled due to insufficient enrollment.

The course has been recognized across several relevant departments (BIOL, CHEM and ENVE) as valuable for a variety of undergraduate and graduate degree programs. Because of the previous success of the course and its recognition as an approved elective and/or substitution in multiple Biology and Environmental Chemistry programs, it seems to be a successful and broadly subscribed course worthy of official entry into the catalogue.

Approving this course as a W-designated class will give student credit for the writing they do in this class and will provide an additional W course option, which is needed in the Biology program.

APPROVALS:

		Date	Oct 4, 2011
Signature, Chair, Program/Department of:	Biology and Wildlife		
		Date	10/5/11
Signature, Chair, College/School Curriculum Council for:	CNSM		
		Date	Oct 7, 2011
Signature, Dean, College/School of:	CNSM		

	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: (As needed for cross-listing and/or stacking)

	Date	

Signature, Chair, Program/Department of:	

	Date	

Signature, Chair, College/School Curriculum Council for:	

	Date	

Signature, Dean, College/School of:	

FORMAT 7

Submit originals and one copy and electronic copy to **Governance/Faculty Senate Office**
(email electronic copy to fysenat@uaf.edu)

REQUEST FOR CORE WRITING INTENSIVE DESIGNATOR

SUBMITTED BY:

Department	**Biology and Wildlife**	**College/School**	**CNSM**
Prepared by	**Mary Beth Leigh**	**Phone**	**6656**
Email Contact	**mbleigh@alaska.edu**	**Faculty Contact**	**Mary Beth Leigh**

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

1. ***COURSE IDENTIFICATION:***

Dept	BIOL	Course #	4XX/6XX	No. of Credits	3

COURSE TITLE	**Environmental Microbiology**

Existing Course		New Course Pending Approval*	X

*Must be approved by appropriate Curriculum Council.)

2. ***CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits***

Proposed new course description:
This course focuses on the role of microorganisms in environmentally-relevant processes including bioremediation of pollutants, biogeochemical cycling, corrosion and wastewater treatment, including current methods for studying microbial diversity and function.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize course designator 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 change and explain what has been done to ensure that the quality of the course is not compromised as a result.

This stacked course has been offered 4 times in the past, 3 times as a trial course and once as a seminar, and has drawn enrollment from Biology, Chemistry, Engineering and Ocean Sciences students at the undergraduate and graduate levels. See the application for New Course Approval for additional information.

Written-intensive components of the course:
The majority of the grade in the class is derived from written material, 80% for undergrads and 83% for grad students. The class involves a major term paper assignment, with feedback given to students at multiple stages. Detailed instructions and guidance on writing review articles is also provided early in the semester, and a short diagnostic written assignment is given during the first 2 weeks of class. The term paper is in the form of a scientific review article. Students select a topic of their choice (pending instructor approval), submit an outline, first draft and final draft. Detailed instructor feedback is provided at all stages in written form and students meet individually with the instructor to discuss their writing of the first draft of the term paper. Students are also encouraged to schedule a meeting to discuss the final draft.
The class also has a midterm and final exam, both of which rely heavily on short answer and short essay responses from students.
Students also turn in written assignments (short-answer) related to scientific journal articles that are assigned for in-class discussion (reading questions).

The attached syllabus must clearly reflect the following basic elements for a class to be **WRITING INTENSIVE.** Please note them directly on the syllabus, using the corresponding letter. (See Guidelines in this manual.)

A	A majority of the final grade is derived from writing activities
B	A research paper/project
C	Personal conference with the student
D	Drafts/revisions/Feedback

APPROVALS:

Signature, Chair, Program/Department of:	Biology and Wildlife	Date	Oct 4, 20
Signature, Chair, College/School Curriculum Council for:	CNSM	Date	10/5/11
Signature, Dean, College/School of:		Date	

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

Signature, Chair, Senate Core Review Committee		Date	

ATTACH COMPLETE SYLLABUS (as part of this application).
Note: The guidelines are online: 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:

θTitle, θ number, θcredits, θprerequisites, θ location, θ meeting time
(make sure that contact hours are in line with credits).

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

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

3. Course readings/materials:

θ Course textbook title, θ author, θ edition/publisher.

θ Supplementary readings (indicate whether θ required or θ recommended) and

θ any supplies required.

4. Course description:

θ Content of the course and how it fits into the broader curriculum;

θ Expected proficiencies required to undertake the course, if applicable.

θ Inclusion of catalog description is *strongly* recommended, and

θ Description in syllabus must be consistent with catalog course description.

5. θ Course Goals (general), and (see #6)

6. θ Student Learning Outcomes (more specific)

7. Instructional methods:

θ 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.).

8. Course calendar:

θ 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.

9. Course policies:

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

10. Evaluation:

θ Specify how students will be evaluated, θ what factors will be included, θ their relative value, and

θ how they will be tabulated into grades (on a curve, absolute scores, etc.)

11. Support Services:

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

12. 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.

θ State that you will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities."

BIOL 4XX/6XX
CHEM 6XX XXXXXXXX No cross-list with CHEM
ENVE 6XX XXXXXXXX No cross-list with ENVE
Environmental Microbiology

Instructor: Dr. Mary Beth Leigh
Office: 228 West Ridge Research Building (WRRB)
Phone: 474-6656
Email: mbleigh@alaska.edu
Office hours: XXXXXXX or by appointment

Class time and place
Tuesday and Thursday 9:45-11:15

Course overview
This course provides a comprehensive overview of the role of microorganisms in environmentally-relevant processes including bioremediation of pollutants, biogeochemical cycling and wastewater treatment, and covers modern molecular methods for studying microbes in the environment. Upper level undergraduate and graduate students in Biology, Environmental Chemistry, Environmental Engineering or other related disciplines will gain expertise in microbial processes with an emphasis on their application to environmental quality issues.

Prerequisites
Students should have taken BIOL 115/116 (Fundamentals of Biology), BIOL 342 (Microbiology) and CHEM 105/106 (General Chemistry) or equivalent, or permission of instructor. Exceptions may be made on an individual basis with permission of instructor.

Reading materials
- Many readings will be in the form of **scientific journal articles**, which are electronically available through UAF library and/or provided on Blackboard.
- There is no required text. A text you might like to own is *Brock Biology of Microorganisms* by Madigan and Martinko (11th or 12th Ed.). This and several other books are on reserve at the BioSciences library from which some reading assignments will be made, including:
  - *Environmental Microbiology*, by Maier, Pepper and Gerba
  - *Microbe*, by Schaechter, Ingraham and Neidhardt
  - *Microbiology*, by Bauman
  - *Biocatalysis and Biodegradation*, by Wackett and Hershberger
  - *Brock Biology of Microorganisms*, 11th edition, by Madigan and Martinko
  - *Microbial Ecology*, by Atlas and Bartha

Course objectives
- Understand application of microbial processes to environmental remediation
- Appreciate contribution of microorganisms to geochemical cycling
- Become familiar with methods for studying microbes in the environment
- Develop skills in reading and criticism of primary scientific literature

- Develop literature research, writing and oral presentation skills

Course format: Lectures with supporting readings from textbooks and primary scientific literature will form the knowledge base of the course. Journal articles relevant to the current topic will be assigned for critical group discussion.

Assignments: The goals of these exercises are to help develop research, writing and oral presentation/teaching skills important to success in their postgraduate scientific careers.

- *Reading questions:* When journal articles are assigned for reading and discussion, reading questions (short answer) will also be assigned which should be completed before the beginning of the discussion class period.
- *Invisible Jungle:* Practice skills in communicating science to the public by developing a short (2-min) radio story about a topic in environmental microbiology. See http://www.invisiblejungle.com/ for more information and for sample programs. Students' stories will be submitted to Invisible Jungle for consideration for future broadcasts.
- **[B]** *Term paper and presentation:* All students will independently research an environmental microbiology topic of their choice, subject to instructor approval. Students will prepare a term paper in the form of a review article of 20 pages in length. Students will then deliver ~25 min oral presentations to the class near the end of the semester. Detailed instructions for papers and presentations will be provided in class. **[D]** An outline and first draft of the paper will be due prior to the final deadline. **[C]** Detailed instructor feedback will be provided at all stages in written form and through 1-2 individual conferences with students. See schedule below for relevant deadlines.

  **Support for term paper*: Assistance with library research can be provided by Biosciences librarian Anne Christie (anne.christie@uaf.edu). For guidance with writing consult the Writing Center (8th floor, Gruening Bldg).

Exams: One in-class midterm and final exam will be given to all students, with questions in a variety of formats from multiple choice, fill-in-the-blank, short answer and short essay. Grading of the in-class exam will be identical for all students, however graduate students have an additional take-home written component for the midterm test. Following the midterm exam, graduate students will be assigned a take-home written test in the form of several essay questions requiring independent reading of text and primary literature and preparation of essay responses.

Journal article discussions: Journal articles will be assigned in advance of discussions and made available on Blackboard. Reading questions will also be assigned at the same time. Written responses to these questions should be completed before the beginning of the discussion class period. On discussion days, I will assign 1-2 class members to lead the discussion.

Note on written assignments: Plagiarism will result in a failing grade. Be sure to acquaint yourself with the definition of plagiarism to avoid accidental errors at http://www.uaf.edu/library/instruction/handouts/Plagiarism.html

Course evaluations: I welcome your positive and negative comments at any time. Opportunities to provide anonymous evaluations will be provided at the middle and end of semester.

Students with disabilities

UAF is committed to equal opportunity for all students. Students with even minor disabilities, students who are the first in their families to attempt a four-year college degree, or students whose incomes are low, have opportunities for tutorial and other forms of support from the office of Disability Services or the office of Student Support Services. If you need classroom accommodations or other support, please meet with me during office hours as soon as possible to let me know; and please make an appointment with Mary K. Matthews at the Office of Disability Services at 474-7043 and Student Support Services at 474-2644, to enlist the appropriate support. I will collaborate to provide the appropriate accommodations and supports or services to assist you in meeting the goals of the course.

Grading Scale
(% of total course points)

A+	97 - 100
A	94 - 96.99
A-	90 - 93.99
B+	87 - 89.99
B	84 - 86.99
B-	80 - 83.99
C+	77 - 79.99
C	74 - 76.99
C-	70 - 73.99
D	50 - 69.99
F	< 50

Activity	Number of assignments	Points per assignment	Total	A Written-intensive work
UNDERGRADUATES				
Midterm	1	100	100	100
Final	1	100	100	100
Term paper				
Term paper outline	1	10	10	10
Term paper draft	1	50	50	50
Term paper final draft	1	100	100	100
Oral presentation	1	30	30	
Invisible Jungle radio story	1	20	20	
Reading questions	4	10	40	40
Discussion participation	1	50	50	
		Total (Undergraduates)	**500**	400
GRADUATE STUDENTS				
Midterm	1	100	100	100
Midterm take-home essays	1	100	100	100
Final	1	100	100	100
Term paper				
Term paper outline	1	10	10	10
Term paper draft	1	50	50	50
Term paper final draft	1	100	100	100
Oral presentation	1	30	30	
Invisible Jungle radio story	1	20	20	
Reading questions	4	10	40	40
Discussion participation	1	50	50	
		Total (Graduates)	**600**	500

[A] Note (highlighted above) that written-intensive work comprises the majority of the grade for this class.

Environmental Microbiology- Tentative schedule. Subject to change. Additional reading assignments will be made during the semester from journal articles, material posted on blackboard or on reserve in the BioSciences library.

Day	Date	Lecture topic	Reading assignment	Assignments due
FUNDAMENTALS OF MICROBIOLOGY				
R	9/1/11	Syllabus, Introductions, Overview of Microbial Diversity	Brock (12th Ed) Chapter 1 Section I, Chapter 2 Section III	
T	9/6/11	Microbial Cell Structure and Function Review		
R	9/8/11	Microbial Species Concept, Identifying Microbes	Rosello-Mora 2001 FEMS Microbiology Reviews 25:39-67	
T	9/13/11	Fueling the microbial cell	Bauman p 125-150, Chapter 6 in *Microbe*	
BIOGEOCHEMICAL CYCLING				
R	9/15/11	Term paper guidelines, diagnostic writing assignment		
T	9/20/11	Carbon cycling	Brock Chapter 24 Section I	Deadline for term paper topic approval
R	9/22/11	Discussion	Journal articles TBA	Reading questions
T	9/27/11	N cycling	Brock 24 Section II, Journal articles TBA	
R	9/29/11	In-class small group assignment		Reading questions
T	10/4/11	Sulfur cycling, Geochemical cycles gone wild	Maier 14.4, Maier Chapter 15	
R	10/6/11	Winogradsky column exercise		
T	10/11/11	**MIDTERM EXAM**		
BIOREMEDIATION				
R	10/13/11	Organic contaminants, policy, evolution of biodegradative pathways	Chapter 16 Maier, Wackett Chapter 7	Grad student exam essay responses due
T	10/18/11	Aromatic pollutants, crude oil	Chapter 16 Maier, Wackett Chapter 7	Term paper outlines due
R	10/20/11	Methods for studying organic contaminant degraders		
T	10/25/11	Discussion	Journal articles TBA - Deepwater horizon papers	Reading questions
R	10/27/11	Aerobic PCB degradation	Journal articles TBA	
T	11/1/11	Anaerobic degradation of organic and halogenated contaminants		
R	11/3/11	Discussion	Journal articles TBA	Reading questions
T	11/8/11	Guest lecturers from Alaska Department of Environmental Conservation (tentative date)		Term papers drafts due
R	11/10/11	Metal transformations, Bioremediation of uranium	Maier Chapter 17, Wall and Krumholz. 2006. Annu. Rev. Microbiol.60:149-166	

WASTEWATER TREATMENT				
T	11/15/11	Wastewater treatment, Invisible Jungle draft presentations	Brock Chapter 36	Invisible Jungle drafts (in class)
R	11/17/11	Field trip to wastewater treatment plant (tentative date)		
SPECIAL TOPICS: STUDENT PRESENTATIONS				
T	11/22/11	Student term paper oral presentations		
R	11/24/11	NO CLASS - THANKSGIVING HOLIDAY		
T	11/29/11	Student term paper oral presentations		
R	12/1/11	Student term paper oral presentations		Final term papers due
T	12/6/11	Student term paper oral presentations		
R	12/8/11	Student presentations, final Invisible Jungle stories		
R	12/15/11	**FINAL EXAM 8:00-10:00 am**		