

FORMAT 1

Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).
 See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

| | | | |
|----------------------|---|------------------------|---------------------|
| Department | GPMSL | College/School | SFOS |
| Prepared by | Eric Collins | Phone | x6482 |
| Email Contact | recollins@alaska.edu | Faculty Contact | Eric Collins |

| | | | | |
|--|--------------|-------------------------------------|------------|--------------------------|
| 1. ACTION DESIRED (CHECK ONE): | Trial Course | <input checked="" type="checkbox"/> | New Course | <input type="checkbox"/> |
|--|--------------|-------------------------------------|------------|--------------------------|

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|----------------------------------|------|------------|----------|------------|----------------|----------|
| 2. COURSE IDENTIFICATION: | Dept | MSL | Course # | 294 | No. of Credits | 3 |
|----------------------------------|------|------------|----------|------------|----------------|----------|

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|--|---|
| Justify upper/lower division status & number of credits: | Lecture based course for students with little science background, requires multiple 100 level prerequisite courses so is appropriate for 200 level. Class will have 42 hours of lecture for 3 credits. |
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|----------------------------------|--|
| 3. PROPOSED COURSE TITLE: | Astrobiology: Planets, Oceans, and Life |
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|---|-----------|---------------|--|----------|--|
| 4. To be CROSS LISTED? YES/NO | NO | If yes, Dept: | | Course # | |
|---|-----------|---------------|--|----------|--|

NOTE: Cross-listing requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.

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|------------------------------------|-----------|---------------|--|----------|--|
| 5. To be STACKED? YES/NO | NO | If yes, Dept. | | Course # | |
|------------------------------------|-----------|---------------|--|----------|--|

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online – see URL at top of this page.

| | |
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| 6. FREQUENCY OF OFFERING: | Every Spring |
| | Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants |

| | |
|---|--------------------|
| 7. SEMESTER & YEAR OF FIRST OFFERING (AY2013-14 if approved by 3/1/2013; otherwise AY2014-15) | Spring 2015 |
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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 all that apply) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 6 weeks to full semester |
| OTHER FORMAT (specify) | | | | | | | |
| Mode of delivery (specify lecture, field trips, labs, etc) | lecture | | | | | | |

| | | | | | | |
|-----------------------------------|----------|------------------------|--|--------------------|--|--------------------------|
| 9. CONTACT HOURS PER WEEK: | 3 | 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-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/> for more information on number of credits.

| | |
|-----------------------------------|--|
| OTHER HOURS (specify type) | |
|-----------------------------------|--|

10. **COMPLETE CATALOG DESCRIPTION** including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O Fisheries Management

3 Credits Offered Spring

Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)

MSL F294, Astrobiology, Offered Spring

Study of life in the universe from a transdisciplinary perspective, bringing together insights from physics, astronomy, geology, chemistry, and biology. Topics include the evolution of the universe, planets, oceans and life. Past and present oceans found in the Solar System provide case studies from which to examine the potential for life on and off the Earth.

Societal questions related to the origins of life, global climate change, and the possibility of extraterrestrial life will be discussed. Prerequisites: ENGL 111X and one of the following: BIOL 103X, CHEM 103X, GEOS 101X, PHYS 102X. (3+0)

11. **COURSE CLASSIFICATIONS:** Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities

S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? **If YES, attach form.**

YES:

NO:

X

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

O = Oral Intensive, Format 6

W = Writing Intensive, Format 7

X = Baccalaureate Core

11.A Is course content related to northern, arctic or circumpolar studies? If yes, a

“snowflake” symbol will be added in the printed Catalog, and flagged in Banner.

YES

NO

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 for credit, what is the maximum number of credit hours that may be earned for this course?

CREDITS

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. Note: Changing the grading system for a course later on constitutes a Major Course Change – Format 2 form.

LETTER:

PASS/FAIL:

RESTRICTIONS ON ENROLLMENT (if any)

| | |
|--------------------------|--|
| 14. PREREQUISITES | ENGL 111X and one of the following: BIOL 103X, CHEM 103X, GEOS 101X, PHYS 102X |
|--------------------------|--|

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

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| 15. SPECIAL RESTRICTIONS, CONDITIONS | None |
|---|------|

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| 16. PROPOSED COURSE FEES | \$0 |
| Has a memo been submitted through your dean to the Provost for fee approval? | |
| Yes/No | <input type="checkbox"/> |

17. PREVIOUS HISTORY

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

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

| |
|----------------------|
| <input type="text"/> |
|----------------------|

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

| |
|---|
| New course development for faculty member. Course will fulfill part of instructional workload for faculty member. Room for new course serving up to 30 students will be needed. Room with teleconferencing ability will be needed. |
|---|

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 | <input type="checkbox"/> | Yes | <input checked="" type="checkbox"/> | Contacted Karen Jensen 8/29/13. Resources are available online and at UAF libraries |
|----|--------------------------|-----|-------------------------------------|---|

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)*

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| Course will be offered to all UAF students |
|--|

21. POSITIVE AND NEGATIVE IMPACTS
*Please specify **positive and negative** impacts on other courses, programs and departments resulting from the proposed action.*


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|--|
| A positive impact will be the offering of a new, exciting course for undergraduates available with the MSL Oceanography Minor, which makes use of knowledge of the oceans in a different way from any existing course, and offers a much broader (universal) perspective on the oceans. |
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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.

| |
|---|
| Astrobiology is a nascent field that integrates scientific and societal issues by asking Big Questions: How did life arise? Are we alone in the Universe? What is the future destiny of life on Earth? From experience in the Astrobiology Graduate Program at the University of Washington, and from speaking with instructors from other Introduction to Astrobiology courses around the world, I can say that a course like this nearly always fills to capacity and is a great way to introduce young students, who might not otherwise have interest in science, to the wonders of the natural world. The reason I am offering it as a Trial course rather than a New Course is to judge the interest and to ensure the correct level at which to offer it. |
|---|

APPROVALS: Add additional signature lines as needed.

| | | |
|---|--------|---------|
|  | Date | 8/30/13 |
| Signature, Chair, Program/Department of: | GPM SL | |

| | | |
|---|-----------------------|----------|
|  | Date | 9/9/2013 |
| Signature, Chair, College/School Curriculum Council for | SPOS Curric Committee | |

| | | |
|---|------|-------------|
|  | Date | fy 10, 2013 |
| Signature, Dean, College/School of: | SPOS | |

Offerings above the level of approved programs must be approved in advance by the Provost.

| | | |
|--|------|--|
| | Date | |
| Signature of Provost (if above level of approved programs) | | |

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

| | | |
|--|------|--|
| | Date | |
| Signature, Chair Faculty Senate Review Committee: ___Curriculum Review ___GAAC ___Core Review ___SADAC | | |

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: | | |

ATTACH COMPLETE SYLLABUS (as part of this application). This list is online at:

<http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/uaf-syllabus-requirements/>

The Faculty Senate 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 (or changes to it) may 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 (see #6)

6. Student Learning Outcomes (more specific)

7. 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.).

8. 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.

9. Course policies:

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

10. 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.) Publicize UAF regulations with regard to the grades of "C" and below as applicable to this course. (Not required in the syllabus, but is a convenient way to publicize this.) Link to PDF summary of grading policy for "C":

http://www.uaf.edu/files/uafgov/Info-to-Publicize-C_Grading-Policy-UPDATED-May-2013.pdf

11. Support Services:

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

12. Disabilities Services: Note that the phone# and location have been **updated**. <http://www.uaf.edu/disability/> The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.

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

5/21/2013

MSL 294 Astrobiology: Planets, Oceans, and Life

Spring 2015



Instructor

Dr. Eric Collins
207B O'Neill
(907) 474-6482
recollins@alaska.edu

office hours: Monday/Thursday 3:15 – 4:15 & by appointment

Astrobiology is the study of the origins, evolution, and future of life on Earth and elsewhere in the Universe. From humble beginnings as self-replicating chemical systems in primordial oceans to advanced civilizations capable of interplanetary flight, life has survived and thrived on Earth for billions of years. *But are we alone?* The **goal of this course** is to discover what scientists have learned about life in the universe while working to answer that question.

Textbook

Life in the Universe (3rd Edition) – J. Bennett and S. Shostak (2011) Addison-Wesley

Suggested supplementary readings:

The Astrobiology Primer: An Outline of General Knowledge – L.J. Mix and 21 others (2006)
URL <http://arxiv.org/abs/astro-ph/0610926>

Astrobiology: A Multidisciplinary Approach – J. Lunine (2005) Addison-Wesley

Course outline:

- MWF 1:00—2:00 (3 hours per week), Room 201 O’Neill
- First Day of Classes: Friday, 16 January, 2015
- Mid-term Examination 1: Friday, 13 February, 2015
- Mid-term Examination 2: Friday, 10 April, 2015
- Last Day of Classes: Monday, 4 May, 2015
- Final Examination: XXX, XXX--XXXpm, Room 201 O’Neill

Course description:

MSL 294, Astrobiology, 3+0 credits

Prerequisites: ENGL 111X and one of the following: BIOL 103X, CHEM 103X, GEOS 101X, PHYS 102X.

Study of life in the universe from a transdisciplinary perspective, bringing together insights from physics, astronomy, geology, chemistry, and biology. Topics include the evolution of the universe, planets, oceans and life. Past and present oceans found in the Solar System provide case studies from which to examine the potential for life on and off the Earth. Societal questions related to the origins of life, global climate change, and the possibility of extraterrestrial life will be discussed.

Learning Outcomes:

- Understand and explain the basic physical and chemical structure of the universe
- Evidence knowledge of major planetary formation and evolutionary processes
- Understand and discuss the relevance of water for the origins and evolution of life
- Describe the oceans of the Solar System, and predict their evolution over geologic time
- Explain the planetary geologic processes that influence global climate change
- Engage with peers’ views on the origins and future of life on Earth

Instructional Methods: Lectures and small group discussions. Distance delivery available. All class presentations will be posted as Powerpoint slides on Blackboard. Instructor will use the Blackboard system to communicate with students.

Schedule for Astrobiology Spring 2015

| Tentative Start Date | Topic | Reading (in textbook) |
|-----------------------------|---------------------------------------|------------------------------|
| January 16 | Introduction, syllabus discussion | |
| January 19 | The New Science of Astrobiology | Chapter 1 |
| January 26 | The Old Question: Are we alone? | Chapter 2 |
| February 2 | The Structure of the Universe | Chapter 3 |
| February 9 | How to Make a Planet | Chapter 3 |
| February 13 | Midterm 1 (20%) | |
| February 16 | The Habitability of Earth | Chapter 4 |
| February 23 | Climate regulation and change | Chapter 4 |
| March 2 | Defining Life | Chapter 5 |
| March 9 | Life at the Extreme | Chapter 5 |
| March 13 | Essay 1 due (15%) | |
| <i>March 16–20</i> | <i>Spring Break</i> | |
| March 23 | The Origin of Life | Chapter 6 |
| March 30 | The Evolution of Life | Chapter 6 |
| April 6 | The Habitable Zone Concept | Chapters 7+10 |
| April 8 | The Future of Life on Earth | Chapter 10 |
| April 10 | Midterm 2 (20%) | |
| April 13 | Extinct Oceans: Venus and Mars | Chapter 10 |
| April 15 | Living Oceans: Earth | Chapter 8 |
| April 17 | Icy Oceans: Europa and Ganymede | Chapter 9 |
| April 20 | Weird Oceans: Titan | Chapter 9 |
| April 22 | Extrasolar planets | Chapter 11 |
| April 24 | Essay 2 due (15%) | |
| April 27 | Rare Earth | Chapter 11 |
| April 29 | Drake Equation & Fermi Paradox | Chapters 12+13 |
| May 4 | Contact & the Future of Astrobiology | Chapters 12+13 |
| May [5–8] | Comprehensive Final Exam (30%) | |

Evaluations:

Will be based on 2 mid-term exams, 2 essays, and a cumulative final exam. Grading is absolute.

20% (200 points) Mid-term examination 1: short answer and multiple choice

15% (150 points) Essay 1: see topics and format below

20% (200 points) Mid-term examination 2: short answer and multiple choice

15% (150 points) Essay 2: see topics and format below

30% (300 points) Comprehensive Final exam: short answer and multiple choice

Essay topics:

How will human impacts on Earth's oceans affect the future evolution of life on Earth and in our Solar System?

If human civilization ended tomorrow, what evidence of our existence would be left for extraterrestrial archaeologists to discover after one thousand, one million, and one billion years?

For each topic, provide an essay (up to 2000 words) plus a complete bibliography of all used resources, which can include secondary literature but should also include **primary** literature. The essays can be completed in either order and should be submitted to recollins@alaska.edu by midnight on the date that they are due. Late submissions will not be accepted. Preferred format: 12 pt font, single line spacing, 1" margins.

Course Policies: Students are expected to attend class and read the relevant chapter prior to the first lecture on that topic. This greatly facilitates participation during lectures, which is expected. *You are smarter than your phone. The use of cell phones, texting or other electronic communication (e.g. email, twitter, facebook etc.) during class is considered inappropriate.* Students should be familiar with the UAF Honor Code (you find it in the catalog). Neither cheating, plagiarism nor fabrication will be tolerated. Any student found cheating during the exams or to have plagiarized or fabricated statements (including passages from web pages) will receive an automatic 'F' for the **class**.

*The following **non-curved** grading system will be used for the entire course:*

| | |
|--------------|---|
| A+ >95% | C >63 – 67% |
| A >90 – 95% | C- >60 – 63% |
| A- >85 – 90% | |
| B+ >80 – 85% | <i>Grades below C- will not count toward the major or minor degree requirements</i> |
| B >75 – 80% | D 50 – 60% |
| B- >70 – 75% | F <50 |
| C+ >67 – 70% | |

Support Services: At UAF, the Office of Disability Services (203 WHIT; 474-5655; TTY 474-1827; fydso@uaf.edu) ensures that students with physical or learning disabilities have equal access to the campus and course materials. If you have specialized needs, please contact this office or the instructor to make arrangements. The UAF Writing Center (801 Gruening Bldg) is available for helping students in brainstorming and generating topics, organizing ideas, developing research strategies, the use of citations, and editing for clarity and correctness. Contact them at <http://www.uaf.edu/english/writing-center>

Important contact information for long distance delivery students: The phone number for Lecture room 201 O'Neill in Fairbanks is 907 474-5377.