

Submit originals (including syllabus) and one copy and electronic copy to the Faculty Senate Office
 See <http://www.unf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the
 governing curriculum & course changes.

RECEIVED

CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL MAY 11 2016
 Attach a syllabus, except if dropping a course.

Dean's Office
 College of Natural Science & Mathematics

SUBMITTED BY:

Department	Biology and Wildlife	College/School	CNSM
Prepared by	Pauline Thomas	Phone	474-6294
Email Contact	pthomas10@alaska.edu	Faculty Contact	Kristin O'Brien kmobrien@alaska.edu

1. COURSE IDENTIFICATION: As the course now exists.

Dept **BIOL** Course # **F466** No. of Credits **3**

COURSE TITLE Advanced Cell and Molecular Biology Laboratory

2. ACTION DESIRED: Check the changes to be made to the existing course.

Change Course If Change, indicate below what is changing. Drop Course

NUMBER	TITLE	DESCRIPTION
PREREQUISITES*	FREQUENCY OF OFFERING	

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

CREDITS (including credit distribution) **COURSE CLASSIFICATION**

ADD A STACKED LEVEL (400/600) 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.

ADD NEW CROSS-LISTING Dept. & No. Requires approval of both departments and deans involved. Add lines at end of form for additional signatures.

STOP EXISTING CROSS-LISTING Dept. & No. Requires notification of other department(s) and mutual agreement. Attach copy of email or memo.

OTHER (specify)

3. 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 and the appropriate Faculty Senate curriculum committee. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

COURSE FORMAT: (check all that apply) 1 2 3 4 5 6 weeks to full semester

OTHER FORMAT (specify all that apply)
 Mode of delivery (specify lecture, field trips, labs, etc.)

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found in Chapter 12 of the curriculum manual. If justification is needed, attach separate sheet.)

H = Humanities 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 also submitted W = Writing Intensive, *Format 7 submitted X = Baccalaureate Core

4.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	x
S			

5. COURSE REPEATABILITY:

Is this course repeatable for credit?	YES		NO	x
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Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

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How many times may the course be repeated for credit?

	TIMES
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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
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6. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking, clearly showing the changes you want made. (Underline new wording strike-through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.)

Example of a complete description:

PS F450 Comparative ~~Aboriginal~~ Indigenous Rights and Policies (s)

3 Credits

Offered As Demand Warrants

~~Case study~~ Comparative approach in ~~assessing Aboriginal~~ analyzing Indigenous rights and policies in different nation-state systems. ~~Seven Aboriginal situations~~ Multiple countries and specific policy developments examined for factors promoting or limiting self-determination. Prerequisites: Upper division standing or permission of instructor. (Cross-listed with ANS F450.) (3+0)

BIOL F466 Advanced Cell and Molecular Laboratory

3 Credits

Offered Spring

An advanced laboratory in cell and molecular biology. Modern molecular biological techniques including protein and nucleic acid gel electrophoresis, western blotting, cell fractionation, cellular respiration, enzymology and fluorescence microscopy. Lectures will be supplemented with reading from the primary literature. Special fees apply. Prerequisites: BIOL F360, may be taken concurrent; or permission of instructor. (2+4)

7. COMPLETE CATALOG DESCRIPTION AS IT SHOULD APPEAR AFTER ALL CHANGES ARE MADE:

BIOL F466 Advanced Cell and Molecular Laboratory

3 Credits

Offered Spring

An advanced laboratory in cell and molecular biology. Modern molecular biological techniques including protein and nucleic acid gel electrophoresis, western blotting, cell fractionation, cellular respiration, enzymology and fluorescence microscopy. Lectures will be supplemented with reading from the primary literature. Student projects in this course may satisfy the capstone project requirements of the biological science degree. Special fees apply. Prerequisites: BIOL F360, may be taken concurrent; or permission of instructor. (1-5+4-52+4)

8. GRADING SYSTEM: Specify only one.

LETTER:

PASS/FAIL:

9. ESTIMATED IMPACT

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

No impacts on budget, facilities, or space.

10. 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 Electronic access to literature provided by library is sufficient

11. 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)

Biological Sciences BA and BS programs will be impacted.

12. POSITIVE AND NEGATIVE IMPACTS

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

The change will be strongly positive for students with cell biology/biomedical interests because they will have a second course available in which to complete their capstone requirement.

13. 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. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. 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.

The capstone requirement in the biological sciences major, which takes the form of a research project, can be completed within designated classes. Making this course a "capstone course" will provide an additional class in which students can complete their capstone projects. The change in credit hour distribution is an attempt to make the class easier to schedule for students, which we hope will increase enrollment.

APPROVALS: (Forms with missing signatures will be returned. Additional signature blocks may be added as necessary.)

Signature, Chair, Program/Department of: (Diane Wagner) Date: 2/29/16 Biology + Wildlife

Signature, Chair, College/School Curriculum Council for: CNSM Date: 5-11-16

Signature, Dean, College/School of: CNSH Date: 5/11/16

Offerings above the level of approved programs must be approved in advance by the Provost (e.g., non-graduate level program offering of a 600-level course):

Signature of Provost (if applicable) Date

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

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

ADDITIONAL SIGNATURES: *(As needed for cross-listing and/or stacking, add more blocks as necessary.)*

<input type="text"/>	Date	<input type="text"/>
Signature, Chair, Program/Department of: <input type="text"/>		
<input type="text"/>	Date	<input type="text"/>
Signature, Chair, College/School Curriculum Council for: <input type="text"/>		
<input type="text"/>	Date	<input type="text"/>
Signature, Dean, College/School of: <input type="text"/>		

Note: If removing a cross-listing, you may attach copy of email or memo to indicate mutual agreement of this action by the affected department(s).

If degree programs are affected, a Format 5 program change form must also be submitted.

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

BIOL/CHEM 466 Advanced Laboratory in Cell and Molecular Biology
3 Credits

Dr. Kristin O'Brien
kmobrien@alaska.edu; 474-5311
323E Margaret Murie Building
office hrs: TH 2-3 pm, F 2-3 pm,
and by appointment

Dr. Andrej Podlutsky
apopdlutsky@alaska.edu; 474-6759
AHRB 2W04
office hrs: TBA

Days, time: M,F 1-2 pm, W 1-5 pm

Pre-requisite: BIOL/CHEM 360 Cell and Molecular Biology (or equivalent; may be taken concurrently)

Required items: *Essential Cell Biology* (3rd or 4th edition) by Alberts *et al.* Garland Publishing, 3-ring binder for lab manual. The manual will be available for purchase in the Biology & Wildlife office at the start of the semester.

Course description: An advanced laboratory in cell and molecular biology. Students will learn modern molecular biological techniques including, protein and nucleic acid gel electrophoresis, western blotting, cell fractionation, cellular respiration, enzymology and fluorescence microscopy. Lectures will be supplemented with reading from the primary literature.

Course goals: Students will master lab techniques commonly used in cell and molecular biology, learn how to write a scientific paper, sharpen critical thinking skills, and practice working with others to solve problems. A central goal of this course is to prepare students for working independently in a cell, molecular biology or biochemistry laboratory.

Student learning outcomes: Students will design and conduct experiments to determine the impacts of exercise on cellular metabolism and oxidative stress. Students will become proficient in quantifying protein concentration, measuring maximal activity of key metabolic enzymes, quantifying DNA damage caused by oxidative stress, and measuring mitochondrial respiration rates. Students will become proficient in writing a scientific paper. Students will also become proficient in searching, reading and discussing primary literature.

Instructional methods: This course will be taught through a combination of lectures, laboratories, and discussions of the primary literature. The laboratories this semester will be centered around understanding how tissues are remodeled in response to exercise in rats. We will examine how protein expression changes, how mitochondrial function changes, and how parameters of oxidative stress change in response to exercise. The first 2 months of class will be spent learning laboratory techniques using the control rats while our experimental animals exercise on their running wheels. During the last month, each lab group will choose one set of experiments to conduct on the exercising rats. For example, you might choose to measure mitochondrial function or DNA oxidation. Your final lab report will be focused on this topic.

Prior to each laboratory, we will read and discuss 1-2 articles from the scientific literature in which similar techniques have been used to address similar questions. You are expected to come to class prepared to discuss the papers.

Capstone requirement: This course meets the requirement for a capstone project. You must also enroll in BIOL 400 to receive capstone credit. To receive credit, you must not only pass the course, but also receive a passing grade for the capstone project.

Policies: Students are expected to attend class and complete reading assignments prior to coming to class in preparation for group discussions and/or activities.

Lab assignments are due at the start of each lab period. No late assignments will be accepted unless you have a medical excuse and a doctor's note, explaining your illness. You must attend the lab to earn credit for the assignment. There will be no make-up labs.

Exams: Exams will be based on material covered in both the lecture and lab. If you anticipate missing an exam for family or work commitments, please let us know in advance so that we can make other arrangements. If you must miss an exam because of unexpected, extenuating circumstances (ie; family death, medical excuse) then you must call and/or email both of the instructors before the exam.

Blackboard: Blackboard will be used to post grades, announcements, lab materials, and reading assignments. Please check the Blackboard site on a regular basis. If you have a smartphone, you can download the Blackboard App, which will notify you immediately when new announcements have been posted.

Email etiquette: We will use UAF email accounts to contact students. Please check your UAF account on a regular basis. If you use an alternate account, please have your UAF email forwarded to that account. We will do our best to respond to your email inquiries within 24 hrs. Please be considerate in your letters and use proper English grammar. Think before you send and never write anything you would feel uncomfortable saying to us (or anyone else) in person. Please use a greeting and sign your letter; addresses don't always reveal the identity of the writer.

Disabilities: Please let us know if you have a disability. We will work with the Office of Disabilities Service (203 WHIT, 474-7043) to provide accommodations in both the classroom and laboratory to provide equal access to all materials in this course to all students.

Support services: Writing Center 801 Gruening

Grading: Your final grades will be based on the following:

1. **Exams (200 pts):** There will be two exams during the semester (a mid-term and final), each worth 100 points. The purpose of these exams is to assess your understanding of

the material, interpret data from the primary literature, and to develop your written communication and critical thinking skills. The exams will cover material from lectures and labs. They will be a combination of short answer and multiple choice questions.

2. Laboratory assignments (425 points):

- a. **Short assignments (140 pts).** A short assignment, worth 10-25 points (140 points total), will be given following each laboratory. Some of the questions will cover material in the lab for the following week. It is extremely important for you to read the lab before coming to lab. Many of the labs we will do are complex. You will enjoy the lab more, understand it better, and are more likely to obtain good results if you come prepared. Please answer your homework questions using complete sentences and neat handwriting. Points will be deducted for incomplete sentences, misspellings, poor grammar and illegible writing.
- b. **Lab notebook (60 pts).** Each student will maintain a lab notebook. These will be checked 3 times during the semester for completeness. The first notebook check will be worth 10 pts, the second, 20 pts, and the third, 30 pts (60 pts total). Requirements for the lab notebook will be explained during the first lab.
- c. **Lab reports (200 pts).** The labs in this course build upon one another to assess how muscle becomes remodeled in response to exercise. You will write one complete lab report, detailing the results from all experiments that will be due at the end of the semester. Following each set of labs (ie; cellular respiration, enzymology, etc.), you will write a mini-lab report that will include figures, figure legends and a summary of the results and appropriate statistical analyses. Each of these mini-lab reports will be worth 25 pts (100 pts total). Your final lab report, which will include all figures, figure legends, results, a title, abstract, introduction and discussion, will be worth 100 pts.

3. **Class discussions (75 pts).** You will be tasked with leading the discussion on a scientific paper at least once during the semester and will be required to participate in discussions.

In summary your grade will be based on the following:

<u>ASSIGNMENT</u>	<u>POINTS</u>
Exams:	2 X 100 = 200
Short lab assignments	140
Lab notebook	60
Lab report	200
<u>Class discussion</u>	<u>75</u>
	675 points total

Final grades will be calculated based on the percentage of points earned out of the total as follows:

Grade	% of Total Points
A+	97-100
A	90-96
A-	88-89
B+	86-87
B	80-85
B-	78-79
C+	76-77
C	70-75
C-	68-69
D+	66-67
D	60-65
D-	58-59
F	0-57

LABORATORY AND LECTURE SCHEDULE

Date	Topic	Lecturer	Reading
M	Lecture: Introduction to the course	Both	
W	Lab: Basic lab techniques- pipetting, preparing buffers		
F	Experimental Design and IACUC	KOB	
M	Lecture: Exercise metabolism I	KOB	ECB Ch 13, Ch 14, pgs 453-476
W	Lab: Dissect control rats (N=4) Cell fractionation Cellular respiration	KOB	
F	Lecture: Exercise metabolism II; discussion	KOB	Egan and Zierath (2013)
M	Lecture: Oxidative Phosphorylation	KOB	
W	Lab: Analysis of mitochondrial respiration data	KOB	
F	Lecture: Exercise and oxidative stress I	KOB	
M	Lecture: Exercise and oxidative stress II; Discussion	KOB	Powers et al., (2011)
W	Lab: Comet Assay 1	AP	Collins (2008)
F	Lecture: Oxygen-binding proteins and exercise I	KOB	
M:	Lecture: Oxygen-binding proteins and exercise II; Discussion	KOB	Pesce et al., (2002)
W	Lab: Tissue homogenization Bradford protein assay	KOB	
F	Lecture: Mitochondrial biogenesis and exercise I	KOB	
M	Lecture: Mitochondrial biogenesis and exercise II; Discussion	KOB	Menshikova et al., (2006)
W	Lab: SDS-polyacrylamide gel electrophoresis & Western blotting	KOB	ECB Ch 4, pgs 164-167
F	Lecture: Exercise and gene expression I	KOB	
M	Lecture: Exercise and gene expression II; Discussion		Stephens et al., 2015
W	Develop Western Blots & Data Analysis	KOB	
F	Mid-term exam		
M	Enzyme kinetics	KOB	
W	Lab: Enzymology- Maximal activity of citrate synthase and catalase	KOB	
F	Data analysis	KOB	

M	Lecture: DNA stability and health	AP	Cha (2013)
W	Lab: Comet assay 2: Image analysis	AP	
F	Lecture: DNA repair and aging	AP	Vijg (2014)
M	Lecture: Exercise and the brain	AP	Wrann et al., 2013
W	Lab: Comet assay 3: Image analysis	AP	
F	Lecture: Epigenetics	KOB	Rönn et al., (2013)
M	Comet assay 4: Final analysis	AP	
Weeks 11-14	INDEPENDENT PROJECTS		
	Final exam TBA		