

**FORMAT 2**

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

**CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL**

Attach a syllabus, except if dropping a course.

**SUBMITTED BY:**

Department	Biology & Wildlife	College/ School	CNSM
Prepared by	Diana Wolf	Phone	474-5538
Email Contact	dewolf@alaska.edu	Faculty Contact	Diana Wolf

**1. COURSE IDENTIFICATION: As the course now exists.**

Dept	BIOL	Course #	362	No. of Credits	4
------	------	----------	-----	----------------	---

<b>COURSE TITLE</b>	Principles of Genetics
---------------------	------------------------

**2. ACTION DESIRED: Changes to be made to the existing course.**

<b>CHANGE COURSE</b>	<input checked="" type="checkbox"/>
<b>DROP COURSE</b>	<input type="checkbox"/>
<b>NUMBER</b>	<input checked="" type="checkbox"/>
<b>TITLE</b>	
<b>DESCRIPTION</b>	
<b>PREREQUISITES</b>	
<b>FREQUENCY OF OFFERING</b>	
<b>CREDITS (including credit distribution)</b>	
<b>COURSE CLASSIFICATION</b>	
<b>CROSS LISTED</b>	
<i>Dept. (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)</i>	
<b>STACKED (400/600) Include syllabi.</b>	
<b>Dept. and Course #</b>	
<b>OTHER (please specify)</b>	

**RECEIVED**  
 SEP 20 2012  
 Dean's Office  
 College of Natural Science & Mathematics

Governance  
 10/3/12 TJP  
 Leah Bernier  
 9/21/12 TJP

**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 <b>all</b> 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 on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities	S = Social Sciences
----------------	---------------------

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

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	Natural Science, Format 8 submitted
---	---	-------------------------------------

**5. 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
--	---------

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

**BIOL F362 Principles of Genetics (n)**  
**4 Credits**  
Principles of inheritance; physiochemical properties of genetic systems.  
Special fees apply. **Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; MATH F107X or higher.** (3+3)

**7. COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES:**  
(Underline new wording ~~strike-through old wording~~ and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) **PLEASE SUBMIT NEW COURSE SYLLABUS.** For stacked courses the syllabus must clearly indicate differences in required work and evaluation for students at different levels.

**BIOL F362 2XX Principles of Genetics (n)** F260 is new approved course number.  
**4 Credits**  
 Principles of inheritance; physiochemical properties of genetic systems.  
 Special fees apply. **Prerequisites: BIOL F115X; BIOL F116X; CHEM F105X; MATH F107X or higher.** (3+3)

**8. IS THIS COURSE CURRENTLY CROSS-LISTED?**

YES/NO	No	If Yes, DEPT	NUMBER

(Requires written notification of each department and dean involved. Attach a copy of written notification.)

**9. GRADING SYSTEM: Specify only one**

LETTER:	<input checked="" type="checkbox"/>	PASS/FAIL:	<input type="checkbox"/>
---------	-------------------------------------	------------	--------------------------

**10. ESTIMATED IMPACT**

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

No impacts on budget, facilities, or faculty workloads anticipated.

**11. LIBRARY COLLECTIONS**

Have you contacted the library collection development officer ([kljensen@alaska.edu](mailto: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 checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No change in library resources needed
----	-------------------------------------	-----	--------------------------	---------------------------------------

**12. 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)

Principles of Genetics is required for the B.S. degree in Fisheries and Wildlife Biology & Conservation. It serves as an option, along with several other courses, to fulfill a requirement for the Chemistry B.S. (Biochemistry Concentration). We have contacted Mark Lindberg, program chair of Wildlife Biology and Conservation, and William Simpson, chair of Chemistry about this change and have received no objections.

**13. POSITIVE AND NEGATIVE IMPACTS**

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

The positive impact of this action is that it will allow the Biology department to better align its Biological Sciences degree curricula. Principles of Genetics will remain a required course for all students and will serve as a prerequisite for a 300-level cell biology course. This will avoid redundancy in the content of the genetics and cell biology courses. Together, genetics and cell biology courses will serve as a foundation for new 400-level courses in cell biology and a new B.S. concentration in cell and molecular biology.

A potential negative impact is that Principles of Genetics will no longer provide students with upper division credit. However, the Biological Sciences B.A. and B.S. degrees have been revised in many ways to assist students in obtaining their required upper division credit. There is, however, a potential impact on Fisheries and Chemistry students.

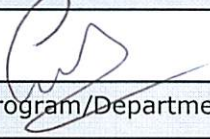
### **JUSTIFICATION FOR ACTION REQUESTED**

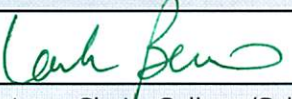
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory.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

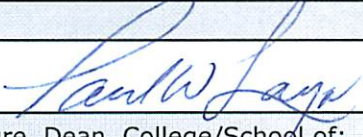
Changing Principles of Genetics from the 300 to the 200 level will assist in sequencing courses in the curriculum effectively. Currently, the subject matter covered in Principles of Genetics overlaps quite a bit with the subject matter taught in BIOL F261, Introduction to Cellular and Molecular Biology. As part of a larger set of curricular changes, BIOL 261 will become a 300-level course and will use Principles of Genetics (BIOL 2XX) as a prerequisite. This will avoid redundancy and allow the cell biology instructor to build on the basic concepts of genetics. The tools and concepts of genetics are fundamental to all sub-disciplines of modern biology. Therefore, Principles of Genetics (BIOL F2XX) will continue to be required of all students. In contrast, the cell biology course will become one of several optional courses for the Biological Sciences B.A., and a required course for a subset of concentrations for the B.S.

Principles of Genetics is currently taught like a lower-division course. Students are given a great deal of "hand holding" such as daily clicker quizzes and weekly homework. Upper level classes should include discussion of the primary literature, but most genetics primary literature is too advanced for undergraduates, containing too many complex molecular techniques, so instead we discuss readings from Discover magazine. The change in course number will therefore make the catalog better reflect how the course is actually taught.

**APPROVALS: (Additional signature blocks may be added as necessary.)**

	Date	09/19/2012
Signature, Chair, Program/Department of: <u>Biology and Wildlife</u>		

	Date	9/26/2012
Signature, Chair, College/School Curriculum Council for: <u>CNSM</u>		

	Date	10/1/12
Signature, Dean, College/School of: <u>CNSM</u>		

Signature of Provost (if applicable)	Date	
--------------------------------------	------	--

**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.**

Signature, Chair, UAF Faculty Senate Curriculum Review Committee	Date	
--	------	--

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

Signature, Chair, Program/Department of:	Date	
--	------	--

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

Signature, Dean, College/School of:	Date	
-------------------------------------	------	--



F260 is new approved course number.

**Syllabus: Principles of Genetics (BIOL 2XX, 4 credits) Fall 2013**

**Prerequisites:** BIOL F115X; BIOL F116X; CHEM F105X; MATH F107X or higher

**Lectures:** MWF 11:45-12:45 Elvey Auditorium

**Labs:**

Mon 2:15-5:15 Bunnell 408 (F01: )

Tue 2:00-5:00 Bunnell 408 (F02: )

Wed 2:15-5:15 Bunnell 408 (F03:)

**Final Exam:**

**Instructor:** Diana Wolf

email: [dewolf@alaska.edu](mailto:dewolf@alaska.edu)

Office hours: Mon, Wed, Fri 1-2 (after class), and by appointment.

Office: 240 West Ridge Research Building (WRRB) 474-5538

Please feel free to contact me by phone, email, or in my office if you need help with course material.

**Teaching assistants (TAs):**

**Course readings/materials:**

**Textbook:** Pierce, B.A. 2010 Genetics: A Conceptual Approach. 4th Ed. W.H. Freeman and Company. ISBN 1429232501.

This textbook is available on reserve in the BioSciences library in the Arctic Health Building.

Supplementary readings are required and will be provided as appropriate.

**Clickers:** Turning technologies Response Card RF (sold at UAF bookstore- same as that used for Intro Biology and Chemistry). **You must register your clicker ID on blackboard by Sept. 10.**

**Blackboard:** <http://classes.uaf.edu/>

The Blackboard web site contains lab and lecture handouts, homework assignments, and practice tests.

Course materials will be updated daily, so you should check regularly. If you miss class, this is the place to go.

**Course description:** Principles of inheritance; physiochemical properties of genetic systems. Course covers Mendelian genetics, molecular genetics, quantitative genetics, population genetics, and molecular evolution.

**Course goals and learning outcomes: Why do you look like your family? Why aren't you identical to your family?** Students will learn the fundamentals of Mendelian and molecular genetics, as well as how these topics are important in everyday life; topics such as genetic diseases, stem cells, forensics and genetically-modified organisms (GMOs). Additionally, students will gain experience with critical thinking, problem solving, writing and will gain hands on practice in modern laboratory skills.

**Instructional methods:** Students will learn through lecture, hands-on laboratory activities, homework, computer simulations, small group discussion, and by writing research reports and giving a short presentation.

**Course policies:** You are expected to attend all lectures and your appropriate lab period, to arrive on time, and to participate in all laboratory activities including discussions and computer simulations. You are also expected to read the assigned textbook chapters and supplemental reading materials. This is a difficult class, with many details to master. You will not be able to master these concepts without reading your textbook. **If you miss class, please check blackboard for the powerpoint lecture, readings and**

**homework, and review them before contacting me.** Homework will be assigned weekly and is due in blackboard. **There will be periodic quizzes during lectures, most delivered by clickers. You MAY NOT make up missed quizzes.** If you cannot attend your regular lab section, you should attend one of the other lab sections the same week. Contact both your regular TA and the TA of the lab you will attend prior to your regularly scheduled lab and the lab you will attend to request permission.

**Unless specifically stated in the assignment, all papers, quizzes and exams should be performed by you, by yourself.**

Please, no cheating on exams or quizzes. You are in school to learn, and I hope that you want to learn. If you resort to cheating, you won't study as hard, and you won't learn as much, so you will be cheating yourself of an education. If you are involved in cheating or plagiarism, you will receive an F in the course, and will be referred to the Associate Dean of Students & Director of Judicial Services for disciplinary action.

If you are re-taking this class, please come see me in my office so we can discuss whether you need to redo the lab and how to make sure you can succeed in this class.

You must take exams at the scheduled time and place.

**Points will be deducted from late assignments at a rate of up to 10% per day.**

**Disagreements about grading:**

If you disagree with the way something has been graded, please submit your explanation in writing, along with the graded work. If a simple mistake was made in tallying points or scoring, this can be easily corrected. If you have been told that the correct answer is different from your answer, but you believe your answer to be correct, you must submit an explanation that includes references to the textbook, class handouts and/or the scientific literature.

**Support Services:**

If you require more assistance than can be provided in class, lab and meetings with the course instructor/TAs, you may want to contact Student Support Services (<http://www.uaf.edu/sssp/>). They provide free services to eligible students, including: tutoring, math help, academic advising, mentoring and personal support, and cultural and social engagement. You may be eligible if you have a limited income, a documented physical or learning disability, or are a first generation college student (meaning that neither of your parents earned a Bachelor's degree)

**Disabilities Services:**

If you have a disability, or think you may have a disability, please contact the Office of Disabilities Services (203 WHIT, 474-7043). We will work with this office to provide reasonable and appropriate accommodation to students with disabilities.

**Evaluation:**

Student performance will be evaluated through 5 exams, weekly homework assignments and quizzes, several papers, one short presentation, laboratory reports and lab participation. Grade cutoffs are A:90%, B:80%, C:70%, D:60%, F:<60%.

Exam 1	15%
Exam 2	15%
Exam 3	15%
Exam 4	15%
Final Exam	15%
Homework (due each Thursday at 10pm on Blackboard) and Quizzes (during lecture, no makeup quizzes)	12.5%
Lab (lab handouts, presentations, papers, quizzes)	12.5%

**Tentative Schedule:**

Do not rely on this schedule. Timing of topic coverage is subject change and will be updated on blackboard. **Exam dates will not change.**

	<b>Lecture</b>	<b>Reading</b>	<b>Lab</b>
Aug 31	Introduction	Ch 1	
Sept 3	<b>Labor Day, no class</b>		<b>No lab this week</b>
Sept 5	Chromosomes and cellular reproduction	Ch 2	
Sept 7	DNA structure, DNA replication, transcription, translation	Handout	<i>Deadline for fee payment, adding classes</i>
Sept 10	Transcription, translation	Handout	Meiosis & Mitosis, DNA replication,
Sept 12	Basic Principles of heredity (1-locus, sex-linked, lethal)	Ch 3	transcription, translation, Fruit DNA extraction
Sept 14	Basic Principles of heredity (chi-square, probability)	Ch 3	<i>Deadline to drop course (nothing on transcript)</i>
Sept 17	2 unlinked loci, chi square, probability	Ch 3	Computer Flies 1 (1-locus, sex-linked, lethal)
Sept 19	Sex determination	Ch 4	
Sept 21	Extensions (epistasis, penetrance)	Ch 5	
Sept 24	Extensions (epistasis, penetrance)	Ch 5	Computer Flies 2 (2 loci, epistasis), Genetic Disease introduction
Sept 26	Review/catchup		
Sept 28	<b>Exam 1</b>		
Oct 1	Pedigrees	Ch 6	DNA extraction - plants
Oct 3	Linkage, Recombination	Ch 7	
Oct 5	Linkage, Recombination	Ch 7	
Oct 8	Mapping	Ch 7	Computer Flies 3 (linkage)
Oct 10	Mapping	Ch 7	Genetic Disease Presentations (group project)
Oct 12	Physical mapping	Ch 7	
Oct 15	Finding genes for traits, PCR	Ch 7	
Oct 17	Review, catchup		PCR, Computer Flies 4 (mapping)
Oct 19	<b>Exam 2</b>		
Oct 22	Quantitative Genetics	Ch 24	Gel of PCR, PCR cleanup
Oct 24	Quantitative Genetics	Ch 24	Complex traits, colon cancer
Oct 26	Quantitative Genetics	Ch 24	
Oct 29	DNA sequencing, 23 and me		DNA sequencing, 23 and me,
Oct 31	Quantitative Genetics	Ch 24	SNP array activity
Nov 2	QTLs, SNP arrays	Ch 24	
Nov 5	Chromosome rearrangements, transposable elements	Ch 9	WRRB tour, Chromosome rearrangements QTL activity,
Nov 7	Polyploidy, aneuploidy	Ch 9	
Nov 9	Review, sequence analysis		
Nov 12	<b>Exam 3</b>		DNA Sequence Analysis



Nov 14	Transposable elements	Ch 11	
Nov 16	Transposable elements	Ch 11	
Nov 19	Transformation, sequencing, next gen seq	Ch 19	Bacterial Transformation, shotgun sequencing
Nov 21	Transgenic organisms, biotech	Ch 19	
Nov 23	<b>Thanksgiving Holiday, no class</b>		
Nov 26	Genomics and Proteomics	Ch 20	No lab this week
Nov 28	Genomics and Proteomics	Ch 20	
Nov 30	Chromosome structure – move to earlier	Ch 11	
Dec 3	Epigenetics – how can we do this without transcription, translation?		Check transformation results, Gene Therapy
Dec 5	Review, catchup		
Dec 7	<b>Exam 4</b>		
Dec 10	Review		
Dec 12	10:15 am -12:15 pm Elvey Auditorium <b>Final Exam (cumulative)</b>		<b>No lab this week (exam week)</b>