



**UNIVERSITY OF CALGARY**  
**UNIVERSITY OF CALGARY**  
**FACULTY OF SCIENCE**  
**DEPARTMENT OF BIOLOGICAL SCIENCES**  
**COURSE OUTLINE**

**1. Course:** BIOL 311, Principles of Genetics -- Spring 2018

<b>Instructor Name</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
<i>L01: ( MWF 10:00 - 11:50 in ST 129)</i>				
Anna Manko	anna.manko@ucalgary.ca	403-220-8573	BI 466	Please send me an e-mail to book an appointment
<b>Coordinator(s):</b>				
Isabelle Barrette-Ng	mibarret@ucalgary.ca	403-220-6240	BI 430A	Please use the following link to book an appointment with me: <a href="https://isabellebarretteng.youcanbook.me">https://isabellebarretteng.youcanbook.me</a>

UNIVERSITY OF CALGARY  
DEPARTMENT OF BIOLOGICAL SCIENCES  
**COURSE OUTLINE**

**1. Course:** **Biology 311 - Principles of Genetics**

Lecture Sections:	L01	MWF	10:00-11:50	ST 129	Spring 2018
LAB	B01 B02	TR TR	09:00-11 :45 13 :00-15 :45	EEEL 309 EEEL 309	

All scheduled laboratories will begin on Thursday, May 17, 2018. Students need to read the introduction to the laboratory manual and Lab #1 prior to attending the first lab and be comfortable with all terms used.

<b>Instructor(s):</b>	Dr. Anna Manko	BI 466	anna.manko@ucalgary.ca
<b>Lab Coordinator:</b>	Dr. Isabelle Barrette-Ng	BI 430A 220-6240	mibarret@ucalgary.ca

D2L Course Site— BIOL 311 L01 - (Spring 2018) - Principles of Genetics (P2018BIOL311L01)

Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

**2. PREREQUISITES:** Any two of Biology 231, 233, 241 and 243.

**3. GRADING:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

<b>Assignments</b>	<b>7%</b>
<b>Midterm Exam</b>	<b>28%</b>
<b>Final Exam</b>	<b>35%</b>
<b>Laboratory</b>	<b>30%</b>

There will be a 2 hour final exam scheduled by the Registrar's office between June 28-June 30.

Each piece of work (assignment, laboratory report, midterm test or final examination) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

**4. Missed Components of Term Work.** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: <http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html>. It is the student's responsibility to familiarize himself/herself with these regulations. See also <http://www.ucalgary.ca/pubs/calendar/current/e-3.html>.

**5. Dates and times of MT Exam(s):**

**Midterm Monday, June 4, 2018 IN CLASS 10:00AM-11:45AM Location: ST129**

**REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY** . If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

**6. EXAMINATION POLICY:** No electronic or written aids (eg. cell phones, tablets, computers, PDAs, notes, textbooks) will be allowed during writing of any exams. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do this will be clearly indicated on the examination paper. Students should also read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.html>

**7. WRITING ACROSS THE CURRICULUM:** In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those

reports. See also <http://www.ucalgary.ca/pubs/calendar/current/e-2.html>.

**8. STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS.** See also <http://www.ucalgary.ca/pubs/calendar/current/e-5.html>.

**9. OTHER IMPORTANT INFORMATION FOR STUDENTS:**

**(a) Academic Misconduct:** (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties.

**(b) Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

**(c) Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at [http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities\\_0.pdf](http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf).

Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email [addy@ucalgary.ca](mailto:addy@ucalgary.ca) or phone 403 220-3140.

**d. Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

**e. Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.

**f. Student Union Information:** VP Academic Phone: 403 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)

SU Faculty Rep. Phone: 403 220-3913 Email: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca) and [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca);  
Student Ombuds Office: 403 220-6420 Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca); <http://ucalgary.ca/provost/students/ombuds>

**g. Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

**h.** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses ([www.ucalgary.ca/usri](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

**Department Approval** \_\_\_\_\_ **Date** \_\_\_\_\_

B311 CO P17

TEXT: Required: An Introduction to Genetic Analysis, 11<sup>th</sup> ed., Griffiths, Wessler, Carroll, Doebley (10th ed. is also acceptable)

acceptable) Solutions Megamanual for An Introduction to Genetic Analysis, 11th Edition, Fixsen, W.D., Lavett, D.K., W.H. Freeman. (10th ed. is also

Carolina Drosophila Manual, Flagg, R.O., 5<sup>th</sup> Edition, Carolina Biological Supply Company

Biology 311 Laboratory Manual, Spring 2018 (To be downloaded from D2L)

EXPECTED STUDY TIME: At least two hours per one-hour lecture plus the required laboratory

\*Dates: Midterm \_\_\_\_\_ Monday, June 4, 2018 \_\_\_\_\_ IN CLASS 10:00AM -11:45PM \_\_\_\_\_ Location: ST129 \_\_\_\_\_

\*\* This will be a comprehensive final exam covering the entire course, but with emphasis on the material covered after the midterm exam.

\*\*\* Various lab components have predetermined weighting to a total of 30% as specified in the Lab Manual.

TENTATIVE LECTURE SCHEDULE SPRING 2018

Date(s)	Topic(s)	Chapter(s)
May 14	Intro to course, autosomal and sex-linked inheritance, pedigree analysis	2
May 16	Independent assortment of genes	3
May 18	Linkage, recombination, genetic mapping, chi-square, multiple crossovers	4
May 23		
May 25	Gene interactions	6
May 28	Bacterial and viral genetics	Part of 5
May 30	Bacterial and viral genetics	Part of 5
June 1	Large-scale chromosomal changes	17
<b>June 4</b>	<b>MIDTERM - In class</b>	-
June 6	DNA structure and replication, genetic technologies	Parts of 1, 7, 10, 14
June 8	Genetic variability and DNA polymorphisms	16, 18
June 11	Detection of DNA polymorphisms and phenotypic change	10, 14, 16, 18
June 13	Regulation of gene expression in prokaryotes	11
June 15	Regulation of gene expression in eukaryotes	12
June 18	Epigenetics and Developmental genetics	12, 13
June 20	Mutations and Genetics of Cancer	16, 16
June 22	Transposons	15
June 25	Review session before final exam	
<b>June 28-30</b>	<b>FINAL EXAM scheduled by the registrar</b>	-

**Note:** there is no lecture on the May 21<sup>nd</sup> (Victoria Day)

**Course Site:**

D2L: BIOL 311 L01-(Spring 2018)-Principles of Genetics

**Department of Biological Sciences:**

Office: BIO 186

Phone: 403 220-3140

Email: biosci@ucalgary.ca

**Note:**

Students must use their U of C account for all course correspondence.

**2. Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

**Prerequisite(s):** Any two of Biology 231, 233, 241 and 243.

**Notes:** Successful completion of Biology 311 is required for admission to all the specialty programs offered by the Department. Students are urged to complete this course in their second year to ensure timely completion of the program.

**3. Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	53 %	50 %

This course has a registrar scheduled final exam.

**4. Missed Components of Term Work:**

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself/themself with these regulations. See also [Section E.3](#) of the University Calendar.

## 5. **Scheduled out-of-class activities:**

There are no scheduled out of class activities for this course.

## 6. **Course Materials:**

## 7. **Examination Policy:**

No aids are allowed on tests or examinations.  
Students should also read the Calendar, [Section G](#), on Examinations.

Students should also read the Calendar, [Section G](#), on Examinations.

## 8. **Approved Mandatory and Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

## 9. **Writing across the Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

## 10. **Human & living organism studies statements:**

See also [Section E.5](#) of the University Calendar.

**STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS.** Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

Students are expected to be familiar with [Section SC.4.1](#) of the University Calendar.

## 11. **Reappraisal of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the

student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**

c. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).

d. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email [addy@ucalgary.ca](mailto:addy@ucalgary.ca) or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

e. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.

g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). Student Ombudsman, Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).

h. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.

i. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

j. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).

**Department Approval:**

Electronically Approved

**Date:** 2018-05-10 09:48

## Course Outcomes

- describe, using diagrams, the similarities and differences in chromosome behaviour between mitosis and meiosis
- illustrate how chromosomal behaviour in meiosis underlies Mendel's laws
- identify the inheritance pattern of traits by using pedigree analysis and an understanding of chromosome behavior in meiosis.
- determine gene linkage and calculate genetic map distances by analyzing inheritance patterns using appropriate statistical methods
- describe the epistatic relationship between genes in a given process based on phenotypic inheritance patterns
- illustrate how different alleles of a gene can form using the physicochemical properties of nucleic acids and the molecular anatomy of genes in prokaryotes and eukaryotes

- compare and contrast the regulation of gene expression in prokaryotes and eukaryotes
- design experiments to evaluate the effects, if any, of mutations on gene expression
- identify techniques that can be used to alter the genetic information in a given piece of DNA, and describe how they can be used for gene therapy
- evaluate data mined from online databases to propose a hypothesis describing the molecular basis for a genetically-inheritable disease