**BIOL 3400-02 *Genetics***

Spring, 2023 Instructor: Michael Chen, Ph.D.

Time: Tues, Thurs, 9:25 – 10:40 am E-mail: [mchen@calstatela.edu](mailto:mchen@calstatela.edu)

Location: SH 243 Office Location: BIOS 235 Office Hours: Mon, 9:30-10:30 am.

Thurs, 12:30-1:30 pm.

Or by appt.

**Course Description**

An advanced undergraduate course designed to provide a firm foundation in genetics and the application of this knowledge to a current understanding of the eukaryotic and prokaryotic cell. Topics to be covered include: Mendelian and non-Mendelian genetics; heredity; transmission genetics; transcription, translation, and genetic regulation.

## Student Learning Objectives:

This course informs students about molecular, cellular and organismal genetics and heredity.

***Outcomes: Upon completing this course, students will:***

1. Be able to discuss and describe the structure and critical functions of the eukaryotic cell.
2. Be able to discuss and describe details of transmission genetics and heredity.
3. Be able to apply this knowledge to problems likely to be encountered in a research/experimental setting.

**Textbook:** *Genetics Essentials*, 7th ed., 2019.Textbook is NOT required, but may help in your learning, since pretty much all lecture material (ppt slides) come from the textbook (although some from earlier editions).

**Evaluation:**

**Quizzes/Assignments**: Quizzes/Assignments will be worth 10-20 pts each. There will be NO make-up for absences on days of “problem-solving class”, except in cases of illness, jury-duty or some other unavoidable event (*e.g*., traffic accident). In such cases, I will require a documented excuse for you to make up an assignment.

**Attendance:** Is required because studies have shown a strong correlation between attendance and grades. For each class, you will get 2 points, which will depend ONLY on whether you are present, no matter what the reason. So, you do not need to contact me telling me that you are going to be absent and the reason thereof. Missing 2 points here and there will not affect your grade. I do not take attendance for points on the first day and on exam days. Total ~ 44 pts.

**Exams:** There will be three course material exams (100 pts each) and a final exam (120 pts). All exams will be a mixture of multiple choice and short answers and will occur during the class period. Your final exam will be cumulative. There will be NO make-up exams, except in cases of illness, jury-duty or some other unavoidable event (*e.g*., traffic accident). In such cases, I will require a documented excuse for you to make up an exam.

Course grades will be assigned as follows:

A: 93 – 100 % C+: 75 – 77 % F: 59 % and below.

A-: 90 - 92 % C: 71 – 74 %

B+: 86 – 89 % C-: 68 – 70 %

B: 81 – 85 % D+: 65 – 67 % B-: 78 – 80 % D: 60 – 64 %

**Course Policies**

* **Drop Policy**—The drop policy established by the university will be strictly followed. After the no record drop deadline, students may drop a course only for “serious and compelling reasons”. Failing a course is not an acceptable reason for withdrawal. Acceptable documentation is required verifying the reason for the withdrawal. See the Schedule of Classes for information
* **Credit by Exam**—Credit by Exam is not offered for this course.

**List of Schedule and Topics *(As instructor, I reserve the right to slightly alter the schedule as necessary.):***

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| **Week** | **Dates** | **Topics** |
| 1 | 1/24, 1/25 | Introduction to the course; Chromosomes; DNA structure and replication. |
| 2 | 1/31, 2/2 | Mitosis; Meiosis. |
| 3 | 2/7, 2/9 | Mendelian Genetics; Non-Mendelian Genetics: (2/9). |
| 4 | 2/14, 2/16 | Meiosis (Cont’d); Problem-solving class: 2/16. |
| 5 | 2/21, 2/23 | Review for Exam 1: 2/21  ***Exam 1 – 2/23*** |
| 6 | 2/28, 3/2 | Gene Recombination (GR), Linkage and Mapping. |
| 7 | 3/7, 3/9 | GR, Linkage and Mapping (cont’d, 3/7);  Problem-solving class: (3/9). |
| 8 | 3/14, 3/16 | Chromosomal variation; X-linked inheritance. |
| 9 | 3/21, 3/23 | Review for Exam 2: 3/21  ***Exam 2 – 3/23*** |
|  | 3/28, 3/30 | Spring Break – No classes held. |
| 10 | 4/4, 4/6 | Pedigree, Analysis and Genetic Testing: (4/4);  Population Genetics – Hardy-Weinberg: (4/6). |
| 11 | 4/11, 4/13 | Problem-solving class: (4/11).  Transcription: DNA to RNA; RNA Processing (4/13). |
| 12 | 4/18, 4/20 | Translation: RNA to Protein and Post-translational Processing of Protein. (4/18).  Problem-solving class: (4/20) |
| 13 | 4/25, 4/27 | Review for Exam 3: 4/25  ***Exam 3 – 4/27.*** |
| 14 | 5/2, 5/4 | Gene Expression/Regulation (4/25).  Problem-solving class: (4/27).  . |
| 15 | 5/9, 5/11 | Review for Final Exam. |
| 16 | 12/12-12/17 | ***Cumulative Final Exam – Time and Date TBA.*** |

**ADA:** Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

**ACADEMIC HONESTY:** Students are expected to read and abide by the University’s Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm>. Students who violate this policy will be subject to disciplinary action and may receive a failing grade in the course for a single violation.