

Los Angeles Mission College, FALL 2015

Lecture: MW 10:35-12:00 in CMS 002

Lab: MW 12:10-3:20 in CMS 002

office hours: MW 9:15-10:30 in CMS 002, TTh 3:30-5:00 in CMS 002

(I am also available in the Etudes chat room on Sundays from 8:00-9:00 PM)

Stephen Brown (instructor)

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BIOLOGY 6 (section 0150)

PREREQUISITES: *Chemistry 51, 65 or 101; Math 125 or 123C; English 28 or ESL 8*

ARTICULATION: LAMC Biology 6 & 7 are equivalent to CSUN Biology 106 & 107, CSULA 100A, 100B & 102, and UCLA LS1 & LS2; LAMC Biology 6, 7 & 40 are equivalent to UCLA LS1, LS2 & LS3

STUDENT LEARNING OUTCOMES

1. Students will analyze a controversial issue related to biology, addressing each side of the controversy and justifying their own position on the issue.
2. Students will write a lab report that is sufficient for a scientifically literate person to repeat the experiment and critique the conclusion.
3. Students will interpret, critique and summarize the components of an experiment or study from an original research journal in the biological sciences.

COURSE DESCRIPTION: *Biology 6 is an intensive science course designed for students wishing to major in a natural science at the college/university level. Upon completion of this course, the student will be able to describe and identify the unifying principles of biology through the study of biological molecules, cell structure and function, metabolism, inheritance, cellular reproduction, molecular genetics and evolution. The student will apply the concepts learned in lectures through hands-on application in related laboratory exercises. The laboratory experience will allow the student to develop practical knowledge of many fundamental biological principles by employing an *experimental approach* to scientific inquiry. Students will be required to explore their own questions in many of the labs, and will be required to perform a *final project* at the end of the term. Critical analysis and small group collaboration are encouraged throughout the course.*

COURSE OBJECTIVES: Throughout the semester the student:

1. Applies and interprets the terminology of biology in both written and oral expression.
2. Demonstrates the ability to read with comprehension current, historical, and popular literature in biology.
3. Develops the ability to use classical and contemporary laboratory methods for studying basic life processes.
4. Applies the general concepts from the textbook and other references to the specific principles which are demonstrated in the laboratories, and shows this in written and oral reports.
5. Develops a practical understanding of the use of the scientific method through experimental design.
6. Expresses an awareness of the complexity and inter-relatedness of organisms and their environment.
7. Identifies the unifying themes throughout all hierarchical levels of the life sciences.

REQUIRED BOOKS AND MATERIALS

Biology, 10th ed., Campbell, Reece, et. al. 2014 (ISBN-13: 978-0321775658)

Investigating Biology, 8th ed., Morgan and Carter 2014 (ISBN-13: 978-0321838995)

Biology 6 Lab Pack - additional lab exercises available at the bookstore (or for download online)

Carbonless Lab Notebook, Hayden-McNeil, ISBN-13: 978-1930882355

4 Scantron 815-E forms, 5 Scantron 882-E forms & 4 blue books (or 1 Scantron 882-E form & 4 Scantron 886-E forms)

COURSE GRADE

| | |
|-----------------------------|------------------------------------|
| 8 Quizzes | 12% of Grade (120 points) |
| 4 Exams | 40% of Grade (400 points) |
| Case Study Analysis | 2% of Grade (20 points) |
| Written Communication ILO | 1% of Grade (10 points) |
| Article Review/Presentation | 5% of Grade (50 points) |
| Lab Reports/Worksheets | 22.5% of Grade (225 points) |
| 5 Lab Quizzes | 7.5% of Grade (75 points) |
| Lab Notebook | 5% of Grade (50 points) |
| Participation | 5% of Grade (50 points) |
| | TOTAL 1000 points |

LECTURE (60% of course points): 4 quizzes will be given at the beginning of lecture that are closed book and worth 15 points each. The other 4 quizzes will be taken online through Etudes and will be open book. The lowest quiz score will be replaced by the average of the other quiz scores. Midterm exams are worth 100 points each. Exams and quizzes will consist of multiple choice, short answer and essay questions. Multiple choice questions are to be answered on **Scantron** forms. Short answer and essay questions are to be answered in Blue Books or on Scantron forms 886-E (exams) or 815E (quizzes). Guidelines for the Case Study Analysis and Article Review/Presentation will be detailed in handouts. **This course will also participate in an assessment of the LAMC Written Communication ILO which will be worth 10 points.**

LAB (40% of course points): Students are expected to read each lab exercise **BEFORE** class. For selected labs students will keep records in a lab notebook and answer associated review questions. A subset of these labs will also require a short lab report in the format of a scientific paper (see handout for guidelines). For all other laboratories, students are required to complete the corresponding worksheets and review questions. **Lab reports, worksheets and review questions are due one week after completion of the lab. Copies of lab notebook entries are due with the corresponding lab assignments.** Lab quizzes are worth 15 points each and are usually given at the beginning of class (10:35). The lowest lab quiz score will be replaced by the average of the other quiz scores. Participation will be based on overall attendance, being on time, and professionalism in both lab and lecture.

ANY makeup quizzes or exams will be more challenging than the original, and there will be a 2 point (quizzes) or 10 point (exams) reduction in the score received for unexcused makeups.

Grading Scale:

| | |
|-----------------------|---|
| 900+ pts (90-100%) | A |
| 800-899 pts (80-90%) | B |
| 650-799 pts (65-80%) | C |
| 500-649 pts (50-65%) | D |
| 0-499 pts (below 50%) | F |

ATTENDANCE POLICY

Attendance is required and roll will be taken. **You are responsible for any information, date changes, etc., presented in class, whether or not you are present** (they will be announced via Etudes anyway). Students missing more than 2 consecutive classes without contacting the instructor may be dropped. Students given add slips **must** complete the process by **Friday September 11th**. Students withdrawing from the class must do so by:

Sunday September 13th to avoid receiving a “W” and to receive a refund

Sunday November 22nd to receive a “W”

* Keep in mind the LACCD website is not always available on Sundays due to routine maintenance.

NOTE: *A new state policy in effect as of Summer 2012 limits students to **3 attempts per course**. Receiving a grade or “W” for a course counts as an attempt, **regardless of when the course was taken**. Withdrawal by September 13th (avoiding a “W”) will not count as an attempt.*

RECOMMENDATIONS FOR SUCCESS

This is a demanding class covering a lot of information. Here are some suggestions:

- do **NOT** fall behind in the course, keep up with the material on a weekly basis
- each time you study, spend a few minutes reviewing previous lessons
- **outline** the Powerpoint notes, this will help you to mentally organize the large amount of material you will be learning
- use associations, acronyms to help you remember things
- do the practice questions in the text and Mastering Microbiology – memory retrieval exercises such as these are the most effective way to improve recall and conceptual understanding
- **know the key terms** (you can’t answer questions correctly if you don’t!)
- at a **minimum**, you should **learn** the course material **3 times** in order to retain it well for the exams and quizzes:
 - 1) **comprehend** the class material during the lecture
 - 2) **read** the corresponding material in the text
 - 3) **review** your notes and key terms

*****If you don’t do at least this much, you won’t do well in this class*****

SPECIAL ACCOMMODATIONS

If you require special accommodations for a disability, religious holiday, etc, please inform me within the first week of the course and I will accommodate you if at all possible. For accommodations due to disability, you must consult the Disabled Student Programs and Services office after which we will abide by their recommendations.

IMPORTANT WEBSITES

<https://myetudes.org/portal>

-here you can monitor your scores and standing in the course and engage in discussion forums with the instructor and fellow students

<http://www.lamission.edu/~brownst>

- your instructor's website where you can download course notes and various handouts

<http://www.pearsonmylabandmastering.com/northamerica/masteringbiology/>

-this site contains the textbook publisher's online supplemental study material, practice questions and exercises, all of which are optional

-access requires a code you will receive when purchasing the textbook in the bookstore, or you can purchase access online

COLLEGE RESOURCES FOR STUDENTS

Science Success Center (SSC): Free tutoring is available for all science students in CMS 101 of the Center for Math and Sciences (CMS). For more information visit:

<http://www.lamission.edu/learningcenter/ssc.aspx>

STEM Office: For information on free tutoring, resources and academic counseling for STEM (Science, Technology, Engineering, and Technology) students visit the STEM Center in CMS 014.

<http://www.lamission.edu/stem>

Admissions and Records: Students can register for classes, request transcripts, file petitions for graduation, and drop classes at this office. For more information call 818-833-3322 or visit:

<http://www.lamission.edu/admissions/>

Assessment Center: Offers student assessments in English, English-as-a-Second-Language (ESL) and Mathematics. Please contact the Assessment Center at (818) 364-7613 for more information or visit

<http://www.lamission.edu/assessment/>

Bookstore: For hours of operation, book availability, buybacks, and other information call 818-364-7767 or 7768 or visit <http://eagleslanding.lamission.edu/default.asp>

Counseling Department: For appointments and information call 818-364-7655 or visit <http://www.lamission.edu/counseling/>

Disabled Students Programs and Services (DSP&S): For appointments, eligibility and information call 818-364-7732 or visit <http://www.lamission.edu/dsps/>

Extended Opportunity Programs and Services (EOPS): For appointments, eligibility and information call 818-364-7645 or visit <http://www.lamission.edu/eops/>

Financial Aid: For information and applications call 818-364-7648 or visit <http://www.lamission.edu/financialaid/>

Library: For information on hours, resources, workshops, and other services contact 818-364-7106 or visit <http://www.lamission.edu/library/>

Tutoring Services in Learning Center: Laboratories for Learning, Writing, & Math. Walk-in and appointment services offered. Call 818-364-7754 or visit www.lamission.edu/learningcenter/

Code of Honor and Integrity

Los Angeles Mission College
Department of Life Sciences

Students at Los Angeles Mission College, because they are members of an academic community dedicated to the achievement of excellence and the pursuit of honor, are expected to meet high standards of personal, ethical, and moral conduct. These standards require personal integrity and a commitment to honesty without compromise. Without the ability to trust in these principles, an academic community and a civil society cannot exist. Los Angeles Mission College students and faculty are as committed to the development of students with honesty and integrity as they are to the academic and professional success of its students.

The Code of Honor and Integrity is an undertaking of the students, first and foremost, both individually and collectively, that they will:

1. Not give or receive dishonorable aid during exams, quizzes or assignments
2. Do their share and take an active part in seeing to it that fellow students, as well as themselves, uphold the spirit and letter of the Code of Honor and Integrity.

Some examples of conduct that are regarded as being in violation of the Honor Code include:

- Copying from another's examination or quiz, or allowing another to copy from one's own papers
- Using any unpermitted source of information, human or other, during an exam, quiz or assignment that influences the grade; **this includes the use of technological devices**
- Any student-to-student collaboration that is unpermitted
- Plagiarism (plagiarism is defined as the use, without giving reasonable and appropriate credit to, or acknowledging the author or source, of another person's original work)
- Representing the work of another as one's own work
- Giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid is not permitted (e.g., online quizzes)

As a part of the effort to promote an environment of honesty and integrity during quizzes and examinations, the following guidelines will apply for any courses in the Department of Life Sciences:

1. Students will leave all books and all other non-essential items (e.g. paper, electronic devices) on the floor so that they are not useable nor block the sight line between professor and student. No electronic devices will be in reach.
2. Students will not communicate in any way that will dishonorably assist themselves or another student.
3. Students will leave the room during an exam only if permitted by the professor's policy. If permitted, only one student may leave the room at any time and be gone for only the average length of time needed for the stated purpose. Students will leave all purses, bags, books, phones, jackets, etc., in the classroom during the absence.
4. Students will promote the spirit and letter of the Code of Honesty and Integrity by dissuading fellow students from dishonest activity and, when such casual persuasion does not work, informing the professor of the possible dishonest activity, either anonymously, or otherwise.
5. Students will make every effort to avoid even the appearance of dishonesty or lack of integrity.

Violation of this policy will not be tolerated and violators will be subject to severe penalties. The success of the Code of Honor and Integrity is based upon the collective desire of students, faculty and the community to live in an environment that embraces respect for that which is right – both in the college and in society as a whole.

LECTURE SCHEDULE (tentative)

| Week | Date | LECTURE TOPIC (textbook chapter) |
|------|--------|--|
| 1 | Aug 31 | Introduction – Overview of the Field of Biology (ch 1) |
| | Sep 2 | Atoms & Molecules (ch 2); Water & pH (ch 3) |
| 2 | Sep 7 | <i>HOLIDAY (Labor Day)</i> |
| | Sep 9 | Organic Molecules & Chemical Groups (ch 4); Macromolecules: Polymers & Carbohydrates (ch 5) |
| 3 | Sep 14 | <u>*QUIZ (ch 1-4):</u> Macromolecules: Proteins, Lipids & Nucleic Acids (ch 5) |
| | Sep 16 | Cellular Structure & Function (ch 6) <u>*eQUIZ (on ch 5 & 6) – due by 11:00 AM on Sunday Sep 20</u> |
| 4 | Sep 21 | <u>EXAM #1 on chapters 1-6</u> |
| | Sep 23 | Membrane Structure & Function (ch 7) |
| 5 | Sep 28 | Energy, ATP & Enzymes (ch 8) |
| | Sep 30 | Cellular Respiration: Harvesting Chemical Energy (ch 9) |
| 6 | Oct 5 | <u>*QUIZ (ch 7-9):</u> Photosynthesis (ch 10) |
| | Oct 7 | Cell Communication (ch 11) |
| 7 | Oct 12 | The Cell Cycle, Mitosis & Cytokinesis (ch 12) |
| | Oct 14 | Cell Cycle Regulation (ch 12); Meiosis and Sexual Life Cycles (ch 13) LAMC Written Communication ILO Assessment (10 points) <u>*eQUIZ (ch 10-13) – due by 11:00 AM on Sunday Oct 18</u> |
| 8 | Oct 19 | <u>EXAM #2 on chapters 7-13</u> |
| | Oct 21 | Mendel and the Gene Idea (ch 14) |
| 9 | Oct 26 | The Chromosomal Basis of Inheritance (ch 15) |
| | Oct 28 | DNA Structure & Replication (ch 16) |
| 10 | Nov 2 | <u>*QUIZ (ch 14-16):</u> Gene Expression & Mutations (ch 17) |
| | Nov 4 | Control of Gene Expression (ch 18) |
| 11 | Nov 9 | Viruses (ch 19) <i>***Case Study Due***</i> <u>*eQUIZ (ch 17-19) – due by 11:00 AM on Sunday Nov 15</u> |
| | Nov 11 | <i>HOLIDAY (Veteran's Labor Day)</i> |
| 12 | Nov 16 | <u>EXAM #3 on chapters 14-19</u> |
| | Nov 18 | Biotechnology (ch 20) |
| 13 | Nov 23 | The Immune System (ch 43) |
| | Nov 25 | The Immune System (cont'd) (ch 43) |
| 14 | Nov 30 | Genomes and Their Evolution (ch 21) |
| | Dec 2 | <u>*QUIZ (ch 20, 21 & 43):</u> The Evolution of Populations (ch 23) |
| 15 | Dec 7 | Descent w/Modification: Darwinian View of Life (ch 22) |
| | Dec 9 | The Origin of Species (ch 24); History of Life on Earth (ch 25) <u>*eQUIZ (ch 22-25) – due by 10:00 PM on Sunday Dec 13</u> |
| 16 | Dec 16 | <u>**EXAM #4 on chapters 20-25 & 43</u> (10:00-12:00 in CMS 106) |

***QUIZ:** A quiz will be given in class from 10:35-10:50 after which we will review the answers.

***eQUIZ:** A quiz will be taken online in Etudes and should be completed by the indicated day and time.

PDFs of lecture Powerpoint files are available for download on the instructor's web page:

<http://www.lamission.edu/~brownst/2456>

LABORATORY SCHEDULE

| Week | Date | LAB TOPIC (exercise #) |
|------|--------|---|
| 1 | Aug 31 | LAB 1 – Scientific Investigation (Morgan/Carter #1) |
| | Sep 2 | LAB 2 – The Metric System & Graphing |
| 2 | Sep 7 | HOLIDAY (President's Day) |
| | Sep 9 | *LAB 3 – Gel Filtration Chromatography (Edvotek #108); Writing a Lab Report (NBK = 6) |
| 3 | Sep 14 | LAB 4 – Macromolecules |
| | Sep 16 | **LAB 5 – SDS-PAGE (NBK = 6) |
| 4 | Sep 21 | LAB 6 – Microscopes & Cells (Morgan/Carter #2) |
| | Sep 23 | LAB 7 – Diffusion & Osmosis (Morgan/Carter #3) |
| 5 | Sep 28 | LAB QUIZ (Labs 1-5): LAB 8 – Enzymes (Morgan/Carter #4) |
| | Sep 30 | LAB 9 – Fermentation & Respiration |
| 6 | Oct 5 | LAB 10 – Photosynthesis |
| | Oct 7 | *LAB 11 – Restriction Enzyme Digestion of DNA (NBK = 6) |
| 7 | Oct 12 | LAB QUIZ (Labs 6-10): *LAB 11 – Restriction Enzyme Digestion of DNA (cont'd) |
| | Oct 14 | LAB 12 – Mitosis & Meiosis (Morgan/Carter #7) |
| 8 | Oct 19 | **LAB 13 – Restriction Enzyme Mapping (NBK = 6) |
| | Oct 21 | **LAB 13 – Restriction Enzyme Mapping (cont'd) |
| 9 | Oct 26 | LAB 14 – Principles of Genetic Inheritance |
| | Oct 28 | **LAB 15 – DNA Cloning: Ligation and Transformation (NBK = 8) |
| 10 | Nov 2 | LAB 16 – DNA and Gene Expression |
| | Nov 4 | LAB QUIZ (Labs 11-14): **LAB 15 – DNA Cloning: Inoculation of Bacterial Clones; LAB 17 – Reading Primary Research Articles |
| 11 | Nov 9 | **LAB 15 – DNA Cloning: Plasmid Mini-preps & Digests |
| | Nov 11 | HOLIDAY (Veteran's Day) |
| 12 | Nov 16 | **LAB 15 – DNA Cloning: Gel Electrophoresis of Digested Plasmid Mini-preps |
| | Nov 18 | *LAB 18 – Sickle Cell Genotype by Southern Blot (Edvotek #315) (NBK = 6) |
| 13 | Nov 23 | *LAB 18 – Sickle Cell Genotype by Southern Blot (Edvotek #315); **LAB 19 – PCR Amplification of DNA (NBK = 6) |
| | Nov 25 | LAB QUIZ (Labs 15-17): **LAB 19 – PCR Amplification of DNA (cont'd) |
| 14 | Nov 30 | *LAB 20 – Introduction to ELISA Reactions (Edvotek #269) (NBK = 6) |
| | Dec 2 | LAB 21 – Natural Selection |
| 15 | Dec 7 | Oral Presentations of Reviewed Papers |
| | Dec 9 | LAB QUIZ (Labs 18-21): Oral Presentations of Reviewed Papers ***Article Review Due*** |

- * These labs should be recorded in your lab notebook (NBK = possible points for notebook entry).
- ** These labs should be recorded in your lab notebook and require a formal written lab report.

NOTE: Morgan/Carter labs are from the Morgan/Carter lab manual, all other labs are available in the lab pack or can be downloaded from the instructor's LAMC web page:

<http://www.lamission.edu/~brownst/2457>

SCORE SHEET

| LECTURE POINTS | | |
|----------------|----|----------------------|
| Quiz #1 | 15 | Exam 1 |
| Quiz #2 | 15 | Exam 2 |
| Quiz #3 | 15 | Exam 3 |
| Quiz #4 | 15 | Exam 4 |
| Quiz #5 | 15 | WComm ILO Assessment |
| Quiz #6 | 15 | Case Study |
| Quiz #7 | 15 | Article Review |
| Quiz #8 | 15 | Oral Presentation |

| LABORATORY POINTS | | |
|----------------------|----|---------------------------|
| M/C #1 | 10 | **Restriction Mapping |
| Metric System | 10 | Genetics |
| *Edvotek #108 | 5 | DNA & Gene Expression |
| Macromolecules | 10 | Research Paper |
| **SDS-PAGE | 20 | **DNA Cloning |
| M/C #2 | 10 | *Edvotek #315 |
| M/C #3 | 10 | **PCR |
| M/C #4 | 10 | *Edvotek #269 |
| Respiration | 5 | Natural Selection |
| Photosynthesis | 5 | Participation |
| *Restriction Enzymes | 5 | Notebook Quantity/Quality |
| M/C #7 | 10 | |

** records should be kept in lab notebook*

*** records should be kept in lab notebook AND a formal lab report should be written*

LECTURE possible points:

- quizzes – 15 points each (lowest quiz replaced with average)
- exams – 100 points each
- Written Communication ILO assignment (10 points)
- case study analysis – 20 points
- article review – 50 points (25 points each for written paper and oral presentation)

LAB possible points:

- lab reports/worksheets – points for each lab vary (see possible points for each above)
- lab quizzes – 15 points each (lowest quiz replaced by average)
- lab notebook – 50 points (25 points each for completeness/being up-to-date and quality)
- participation – 50 points (lecture/lab attendance, timeliness, professionalism)

To keep track of your performance throughout the course, enter your scores in the chart above as you receive them. At any point you can add up your total points earned and divide by the total points possible at that stage of the course. Multiply this by 100% and then compare with the grade scale on page 3 of the syllabus to see how you are doing. *You can also check your scores and percentages on Etudes.*