BISC 150: The Nature of Human Health & Disease
4 units
M-Tu-W-Th 10:00am – 12:05pm
Room: ONLINE

Labs
Tues, 1:00 – 2:50 pm
Thurs, 1:00 – 2:50 pm
Room: ONLINE

Course & Lab Instructor: Nancy Castro, Ph.D.
Office: ONLINE
Office Hours: By appointment on zoom
Contact Info: ncastro@usc.edu

Required Texts:
Authors: Judith Goodenough & Betty A. McGuire.

The Nature of Human Health & Disease Laboratory Manual, Spring 2020 (USC Custom Publishing)

Course Description
The Nature of Human Health and Disease course is designed to bring students to a level of understanding of basic human biology, health, and disease, as well as modern biomedical science that will enable them to make rational decisions on personal, ethical, and political issues in their health. This level will be reached through lectures, reading of texts, papers and news media, and laboratory experiments.

Prerequisite(s): no prerequisites

Course Notes
BISC 150Lg is a participatory course. A research project will lead students to become true experts in a subject of their choice and laboratory experiments will give an appreciation of biotechnology.

Learning Objectives

• Students will understand basic human biology at the genetic, cellular and physiological levels.
• Students will know the human body maintains a healthy balance and how disturbances of this balance underlie diseases.
• Students will be familiar with modern biomedical scientific approaches to treating disease.
• Students will be able to make informed contributions to discussions of contemporary issues in health and disease with their peers.
• Students will be able to make rational decisions on personal, ethical and political issues in their health.
**Topic List:**

General Biology Introduction:
- Human physiology, cell and molecular biology, Mendelian genetics

1) Nutrition and Health
   a) Nutrition basics
   b) Supplements/Fad diets
   c) Diabetes

2) Microbiology, Infectious Disease and Vaccines
   a) STDs (HIV)
   b) Influenza/Common cold
   c) Bacterial infection - Human microbiome
   d) How they work and myths — autism, ethics of vaccinating/not vaccinating

3) Evolutionary Biology of Health and Infection
   a) Co-evolution of humans and infectious disease
   b) Third world disease/Global health

4) Genetic Inheritance and Disease
   a) Single gene traits
   b) Complex disease traits — Bipolar disorder, Depression
   c) Cancer
   d) Mental Health

5) Health Care Administration
   a) Health insurance
   b) Drug design/False advertising

6) Drug Effects and Abuse
   a) Prescription Drugs
   b) Street Drugs
   c) Alcohol
   d) Tobacco and Cannabis
Lab Report. Lab reports will consist of a 2-3 page report, double-spaced, on one of the lab techniques studied in lab. The lab report will focus on discussing how your chosen lab technique is currently being used to help prevent, treat, or diagnose a specific disease. The lab report will consist of three main components: 1) Describe the lab technique and how it functions - 15 points, 2) Describe the disease you choose to discuss and give appropriate background – 15 points, 3) Discuss how the technique can be used to prevent, treat or diagnose this particular disease – 20 points, for a total lab report grade of 50 points. A minimum of 3 references need to be used for this lab report. Lab reports must be submitted electronically via Turnitin, using the link provided on the Blackboard site for the lab section. It is each student’s responsibility to confirm that their lab report was successfully uploaded.

Lab Exam. One cumulative lab exam will be given to test your understanding of the topics and exercises covered in the laboratory sessions. The lab exam will cover materials from labs 1 – 10 and consist of multiple choice, fill-in-the-blank, short answer type questions.

Lab Simulations. You will be awarded various points (lab points vary per simulation) for completing the virtual lab simulations on Labster as part of the lab requirements. You will be given 24 hours to complete the lab simulation for credit.

Blackboard and Posting of Grades. Blackboard (https://blackboard.usc.edu/) lists BISC 150 lecture and lab sections as “separate courses”. All grades (lecture and lab) are posted in your LAB section. However, be sure to check for additional postings and announcements both in the lecture section and the lab section on a weekly basis.Blackboard is a convenient system to communicate grades; however, those grades are not authoritative. It is the student’s responsibility to notify your TA or Lab Manager ASAP in the event of any mistakes in your posted grade. Please remember that (1) the course mean given on Blackboard is also NOT authoritative, and (2) that only the total number of points earned determines your course grade. We will be glad to discuss your performance, and your possible grades, at any time throughout the course. Help provided in this way should be considered only provisional. Your later performance may change (sometimes dramatically) the best- meant extrapolation.

Email Communication:
To ensure privacy, only student’s USC email accounts may be used for email communications. Students are responsible for understanding the content of email messages that the instructor sends to their USC accounts. Therefore, each student must check their USC email regularly and make sure their account is not over quota, so new messages can be received.
Grading Breakdown
The course grade will be based upon 686 possible points:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>% of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm 1</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>At-home Quizzes</td>
<td>51 (3pts/ 17 lectures)</td>
<td>7</td>
</tr>
<tr>
<td>In-class problem sets</td>
<td>85 (5pts/ 17 lectures)</td>
<td>12</td>
</tr>
<tr>
<td>Lab Report</td>
<td>50</td>
<td>7</td>
</tr>
<tr>
<td>Lab Exam</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>Online labs</td>
<td>100 (10pts/lab)</td>
<td>15</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>686</strong></td>
<td><strong>100</strong></td>
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Grading Scale
Course final grades will be determined using the following scale:

A   90.1 - 100  
A-  86.7 - 90   
B+  83.3 - 86.6 
B   80 – 83.2  
B-  76.7 – 79.9 
C+  73.3 – 76.6 
C   70 – 73.2  
C-  66.7 – 69.9 
D+  63.3 – 66.6 
D   60 – 63.2  
D-  56.7 – 59.9 
F   ≤56.6

At-home Quizzes & In-class assignments: Before coming to each lecture, you will be required to study the material and answer quiz questions. Each quiz assignment will be worth 3 points and based on the upcoming lecture material. Quiz answers should be submitted prior to the start of class at 10:00 a.m on Mastering Biology. Quizzes will typically be open 48 hours in advance of the next lecture.

Each lecture will have an in-class assignment where questions are expected to be completed by the end of the lecture. Attendance at all lecture sections is expected. If you must miss class due to illness or valid USC travel, please present Dr. Castro with evidence of the reason for absence and you will be allowed to make-up in-class work assignments within 3 days of the missed lecture period.

Exams. There will be 2 midterm exams during the semester and 1 final exam. The Lockdown Browser and Respondous Monitor programs will be used to monitor exams. It is the responsibility of the student to download these programs and make sure there are no technical difficulties before taking the exams. Exams will consists of multiple choice, short answer, matching or fill-in-the-blank questions. Exams are NOT open book nor open notes. A student is not allowed to start an exam after the first student has left ANY exam room.
Grading Timeline
Grades for Midterm Exams will be posted within one calendar week following the exam date.

Additional Policies
Missed exams. There are no makeup exams in the course. If a student misses an exam due to a true emergency, official written documentation (what you feel is appropriate to demonstrate a legitimate reason for missing said exam) should be submitted to the Instructor, within two (2) days of the missed exam. Students will only be excused for ONE exam with a valid excuse. If the written documentation for the missed exam is approved, the scores of the other two exams will be prorated to comprise your total point score. If your excuse is judged not to be valid, or you do not provide it within the allotted time, you will receive a score of zero for the missed exam.

Please note: the Student Health Center has changed their medical excuse policy. The Student Health Center will no longer provide: 1) class excuse notes for illness, 2) clinical appointments for class excuse, and 3) authentication of outside physician certificates. The Absence of Class - Self Verification Form provided by the Student Health Center is insufficient documentation for our purposes.

Re-grades of exam questions. Your midterm exams will be handed back either in lab or lecture and the answer key will be posted. If you feel an error was made in the grading of your exam, you must submit your exam, along with a Regrade Request Form in which you have thoroughly explained (typewritten) why you think your answer deserves more credit, to your TA within 1 week of the time it was returned to the entire class. Oral and email requests will not be considered. If you took the exam in pencil or used white-out, we will not grant regrade requests. The entire answer will be re-graded, not just the part you think deserves more credit. Your score may increase or decrease as a result of a re-grade.
## Course Schedule: The Nature of Human Health and Disease

<table>
<thead>
<tr>
<th>Wk</th>
<th>Lecture</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Reading</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Wed, May 19</td>
<td>Overview: Humans in the world of biology</td>
<td>Ch. 1</td>
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<td></td>
<td>2</td>
<td>Thurs, May 20</td>
<td>Intro to cell biology</td>
<td>Ch. 3</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
<td>2</td>
<td></td>
<td>Mon, May 24</td>
<td><strong>Memorial Day – NO CLASS</strong></td>
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<tr>
<td>3</td>
<td>3</td>
<td>Tues, May 25</td>
<td>How your body gets its energy (Biochemistry)</td>
<td>Ch. 3</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
<td>4</td>
<td>4</td>
<td>Wed, May 26</td>
<td>Body organization and homeo.</td>
<td>Ch. 4</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
<td>5</td>
<td>5</td>
<td>Thurs, May 27</td>
<td>DNA, RNA, proteins and You! (Molecular Biology)</td>
<td>Ch. 21</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
<td>3</td>
<td>6</td>
<td>Mon, May 31</td>
<td>Mutation, Biotechnology &amp; GMOs</td>
<td>Ch. 21</td>
<td>Quiz &amp; Prob. set</td>
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<td></td>
<td>7</td>
<td>Tues, June 1</td>
<td>Genetics</td>
<td>Ch. 20</td>
<td>Quiz &amp; Prob. set</td>
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<td>8</td>
<td>Wed, June 2</td>
<td>Genetic Diseases</td>
<td>Ch. 20</td>
<td>Quiz &amp; Prob. set</td>
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<td></td>
<td><strong>Thurs, June 3</strong> MIDTERM 1 (Lectures 1-7)</td>
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<td>4</td>
<td>9</td>
<td>Mon, June 7</td>
<td>Cancer</td>
<td>Ch. 21a</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
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<td>10</td>
<td>Tues, June 8</td>
<td>The Digestive System</td>
<td>Ch. 15</td>
<td>Quiz &amp; Prob. set</td>
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<td></td>
<td>11</td>
<td>Wed, June 9</td>
<td>Nutrition: Supplements/Fad diets</td>
<td>Ch. 15</td>
<td>Quiz &amp; Prob. set</td>
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<td>12</td>
<td>Thurs, June 10</td>
<td>Nutrition Continued</td>
<td>Ch. 15</td>
<td>Quiz &amp; Prob. set</td>
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<tr>
<td>5</td>
<td>13</td>
<td>Mon, June 14</td>
<td>The Endocrine System</td>
<td>Ch. 10</td>
<td>Quiz &amp; Prob. set</td>
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<td>14</td>
<td>Tues, June 15</td>
<td>Diabetes</td>
<td>Ch. 10a</td>
<td>Quiz &amp; Prob. set</td>
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<td>15</td>
<td>Wed, June 16</td>
<td>Hormones Documentary</td>
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<td>Discussion</td>
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<td><strong>Thurs, June 17</strong> MIDTERM 2 (Lectures 8-14)</td>
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<td>16</td>
<td>Mon, June 21</td>
<td>The Nervous System</td>
<td>Ch. 8</td>
<td>Quiz &amp; Prob. set</td>
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<td>17</td>
<td>Tues, June 22</td>
<td>Drugs and the Mind</td>
<td>Ch. 8a</td>
<td>Quiz &amp; Prob. set</td>
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<td>18</td>
<td>Wed, June 23</td>
<td>Immune System</td>
<td>Ch. 13</td>
<td>Quiz &amp; Prob. set</td>
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<td>19</td>
<td>Thurs, June 24</td>
<td>Human Immunodef. Virus-HIV</td>
<td>Ch. 17a</td>
<td>Quiz &amp; Prob. set</td>
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<td>20</td>
<td>Mon, June 28</td>
<td>HIV Documentary</td>
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<td>Discussion</td>
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<td><strong>Tues, June 29</strong> FINAL EXAM 10:00 – 11:00am (Lectures 15-20)</td>
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<td>Week</td>
<td>Lab #</td>
<td>Date</td>
<td>Labster Simulation</td>
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<td>1</td>
<td>1</td>
<td>Thurs, May 20</td>
<td>Lab Safety &amp; Pipetting</td>
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<tr>
<td>2</td>
<td>2</td>
<td>Tues, May 25</td>
<td>Experimental Design</td>
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<td>3</td>
<td></td>
<td>Thurs, May 27</td>
<td>Cell Membrane &amp; Transport</td>
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<td>3</td>
<td>4</td>
<td>Tues, June 1</td>
<td>Cellular Respiration</td>
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<td>3</td>
<td></td>
<td>Thurs, June 3</td>
<td>Mendelian Inheritance</td>
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<td>4</td>
<td>6</td>
<td>Tues, June 8</td>
<td>Introduction to Food Macromolecule</td>
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<td>7</td>
<td></td>
<td>Thurs, June 10</td>
<td>Diabetes</td>
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<td>5</td>
<td>8</td>
<td>Tues, June 15</td>
<td>Endocrinology</td>
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<td>9</td>
<td></td>
<td>Thurs, June 17</td>
<td>Introduction to Immunology</td>
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<td>6</td>
<td>10</td>
<td>Tues, June 22</td>
<td>Antibodies (Lab Report Due)</td>
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<td></td>
<td>Thurs, June 24</td>
<td>Lab Exam</td>
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</table>
Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.
Diversity at USC - (213) 740-2101
diversity.usc.edu
Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.