**BIOLOGY 1001. Human Biology.** Spring, 2017. (4.0 credits).
**Human Biology** – 5 day sections (Sections 001-005).

Human Biology (Bio 1001) meets the Science & Technology 1st Level core requirement. There are no prerequisites or corequisites for Biology 1001. Human Biology cannot be used for credit toward a major in Biology.

Human Biology is an introduction to the principles of biology using humans as a model organism. The course covers the scientific method, biomolecules; cell theory, cell reproduction, heredity, human genetics, development, structure and function of the human body; and genetic engineering and biotechnology. Lecture and lab is combined, and must be taken together to receive credit for the course.

**Lecture for Human Biology.** Lecture: 9:30 AM – 10:50 AM. Tu and Th, Beury Hall Room 160.

**Lab for Human Biology:** Laboratory meets in Room 151 Biology Life Sciences Bldg. Labs meet on Tuesdays and Wednesdays during the Spring semester. Labs will start the week of January 22, 2017. Dr. Craig Brumwell is the lab coordinator for Human Biology.

**Lecture Instructor:** Gregory Smutzer, Ph.D. Office: Biology Life Sciences Building, Room 352 (not 352a), Biology Life Sciences Building (SW corner of 3rd floor), Temple Main campus. Phone: (215) 204-1236.

**Recommended Textbook:** Human Biology – Concepts and Current Issues, by Michael D. Johnson, Pearson Benjamin Cummings. The fourth (white cover, 2007), fifth (orange cover, 2009), sixth (blue cover, 2011), or seventh (blue-black, 2013) editions of the Human Biology textbook are suitable, and contain all 24 chapters. An electronic version of the textbook is suitable as well. The companion website [practice questions, flashcards] for the course is:


**Grading:** This course has both a lecture and a laboratory component. The lab will make up 22.5% of the course grade. Labs will meet once a week, and you will have a teaching assistant or the lab coordinator for lab. Questions concerning the lab should be directed to your laboratory instructor. A lab syllabus and a lab contract will be made available to you during your first lab meeting. Labs are held every week during the semester. Mandatory safety training will be held during your first regularly scheduled lab. Please remember that attendance for lab is mandatory. Do not miss labs without an excuse. In addition, you will need to purchase a pair of safety goggles for lab. You will need goggles for the Biomolecules lab.

The lecture component will comprise 75.0% of your final grade. For the lecture component, there will be two 80 minute exams during the session, and a two hour final exam. The three exams will make up 72% of your final grade. Exams I and II will have 80-85 questions, and will contain approximately 70 multiple-choice questions, and 10 - 15 true-false questions. The final exam will NOT be comprehensive, but will have ~125 questions. Scantrons will be used for all three lecture exams. Please bring a number 2 pencil to the exam. EXAMS WILL BE HELD IN BEURY 160.

The remaining 3% of your lecture grade will be from one or more quizzes and two in-class assignments. Quizzes will be closed or open book, and will be taken in class. Quizzes are normally 6-7 MC and TF questions. One quiz is announced, and any remaining quizzes (if any) will be unannounced. All quizzes will have equal weight, and will comprise 1% of your final grade. Quiz questions will be displayed on the screen in the front of the room. If you have trouble reading small print, please sit near the front of the room for the quiz. You may want to consider a pair of opera glasses if you have problems reading the quiz questions, and do not wish to sit in the front seats in Beury 160.

Finally, in-class assignments will make up 2% of your final grade, and we will go over the answers together for in-class assignments.

**Fire Alarm during exam.** In case of a fire alarm during an exam, place your exam and Scantron face down on your desk, and immediately exit the room.

Finally, a grade of C minus or better is required to receive credit for this course for most (but not all) majors.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>23.50%</td>
<td>(comprehensive). Please bring a No. 2 pencil for all exams.</td>
</tr>
<tr>
<td>Exam 2</td>
<td>23.50%</td>
<td>(not comprehensive). Exam will be held in Room 160 Beury for all students.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25.00%</td>
<td>(not comprehensive, but a two hour exam)</td>
</tr>
<tr>
<td>Announced quizzes</td>
<td>1.00%</td>
<td>(One announced quiz, all quizzes will have equal weight for final grade).</td>
</tr>
<tr>
<td>Class assignments</td>
<td>2.00%</td>
<td>(Contract, two announced assignments, all have equal weight for final grade)</td>
</tr>
<tr>
<td>Lab grade</td>
<td>25.00%</td>
<td>(Attendance at labs is mandatory). Please do not miss lab without an excuse.</td>
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</table>
Grading Scale for Final Grade. For final grades, we will use plus-minus grading in Human Biology.

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>88% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>78% - 87.9%</td>
<td>B</td>
</tr>
<tr>
<td>55% - 77.9%</td>
<td>C</td>
</tr>
<tr>
<td>50% - 54.9%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;50%</td>
<td>F</td>
</tr>
</tbody>
</table>

(Take your Scantron score, and multiply by 1.25 for the two 80 min exams)
(Take your Scantron score, and multiply by 2 for the one-hour exam)

Incompletes. Incompletes are not normally given in Human Biology. If you request an incomplete due to medical reasons, you will need e-mail me with a reason. Please note that >50% of the coursework must be completed in order to issue an incomplete. All incomplete contracts must be accepted (or rejected) by the student in order to process the form.

Lecture Attendance. Attendance at the lecture is very strongly recommended during the semester.

Makeup exams: If an hourly exam is missed due to a medical or legal reason, you MUST take the exam during final exam time after you have completed the lecture exam. (Thursday, Thursday May 4th from 8 AM -10:15 AM). There will be no exceptions. No more than one lecture exam can be made up during the semester. In order to take a make-up exam, written documentation will be required during the final exam time. Written documentation includes medical, dental, and legal excuses from your physician, dentist, or lawyer. Notes from PAs, chiropractors, auto repair technicians, being a contestant on American Idol, public transit problems, and podiatrists are generally not accepted.

I will need a copy of the documentation for my files. PLEASE UPLOAD YOUR EXCUSE TO OWLBOX BEFORE THE FINAL EXAM ON MAY 4th. If a medical, dental, or legal excuse is not presented by the student, then a missed exam will result in a grade of zero percent. All makeup exams will be multiple-choice, true-false, short answer, and completion questions. Makeup exams will include very few true-false questions, and have a limited number of multiple-choice questions.

Withdrawals: Monday, January 30th is the last day to withdraw from a course (without a W grade). Wednesday, March 22nd is the last day to withdraw from graduate and undergraduate courses (with a W grade).

Final Exam: The last lecture is Thursday, April 27. All classes end Monday, May 1. Tuesday, May 2nd and Wednesday, May 3rd are study days. Final exam for HB is Thursday, May 4th at 8:00 AM in Beury 160. The final exam for lecture will not be comprehensive. The final exam will cover the final third of the course, and will also include the two posted reading assignments: “The Genes of Death,” and the “Learning module on therapeutic cloning.” Due to the large size of the class, we cannot administer the exam earlier (or later) than the scheduled date for anyone who is registered for Human Biology. If you cannot take the exam at the scheduled time, please consider enrolling in the evening section of Human Biology.

Office hours: I will be in Room 352 BLS on Mondays, Tuesdays, and Thursdays from 1 to 2 PM during the semester. I teach a second course from 11 to 12:20 on Tu and Thur. Please e-mail me if you wish to come by at another time. My contact information is on Blackboard.

Cell Phones: Please have consideration for your fellow students. Please turn off all cell phones and pagers before the start of each class. Due to the large size of the class, it is imperative that no talking to other students occurs during lecture or lab. Please enter the classroom before class starts. In addition, try not to leave and re-enter the classroom during lecture.

Other electronic Devices. Please turn off electronic devices during lecture except as described below.

Blackboard and Problem Sets: After every chapter, multiple-choice and true-false questions with answers are posted onto the Temple Blackboard site (http://tupoortal.temple.edu) to help you study. In addition, a back exam for the final exam will be posted. To reach Blackboard, you must use the link mentioned above. You MUST have a temple.edu e-mail address to access Blackboard. Your USER NAME in your e-mail address is your logon name. Please note that these problem sets are supplemental, and are to help you learn about human biology. If you have specific questions, we won't go over the multiple-choice questions in class. If you are unsure of any answers, please ask in class or during office hours. You can also post any questions on the DISCUSSION BOARD in the communication section (button to left of screen) of Blackboard. Please type in the entire question so that I can check your answer. Exam questions will likely include questions from the multiple-choice questions.

PowerPoint Slides. I will post all PowerPoint after we finish a chapter or a module. SLIDES WILL NEVER BE POSTED BEFORE CLASS. There are no exceptions. If you must have access to the slides, please use a digital camera or cell phone camera to capture each slide during class.
Academic Assistance. The math-science center is located on the second floor of 1800 Liacouras Walk, extension 1-8466. This center provides instruction for the basic sciences, and preparation for exams. A current fourth edition of Johnson, and a Starr & McMillan Human Biology textbook is also available for use.

Temple e-mail account. You can obtain an e-mail account online. Go to: http://www.temple.edu/cs/, and press "activate account." You can instantly obtain a Temple e-mail account.

Accommodation. Any student who has a need for accommodation based on the impact of a disability should contact Disability Resources and Services at 100 Ritter Annex (003-00), 1301 Cecil B. Moore Ave., Philadelphia, PA 19122. Phone number: 215-204-1280. If requested, an exam can be prepared in large font for individuals who are registered with DRS and wish to take the exam during normal class time. Accommodations for exams and quizzes will be made for students with documented disabilities.

Academic Integrity and Student Code of Conduct All relevant Temple University policies regarding Academic Integrity must be followed. These policies include no cheating, no plagiarism and reporting any knowledge thereof. Plagiarism is the act of presenting the intellectual work of others as if it were one's own. Please consult the Student Handbook, or the appropriate web-page (http://oll.temple.edu/ih/writing/plagiarism2.htm) for further information.

A copy of the Temple University Code of Conduct is posted on the Human Biology Blackboard site. In addition, a hard copy of the code of conduct will be handed out to you during your first week of lab. Please familiarize yourself with the student code of conduct.

Student Learning Outcomes. The student will demonstrate knowledge of fundamental information concerning biological macromolecules, the structure and function of cells, basic life processes of humans, knowledge of human heredity, knowledge of the structure and function of DNA, knowledge of the structure and function of the major systems of the body, and knowledge of evolution. Assessment: Basic knowledge of these facts, processes, and concepts will be quantitatively assessed through the use of quizzes, lecture exams, in-class assignments, and lab quizzes.

Final Grades. If you feel that your final grade is incorrect, we will recheck all of your grades to identify any potential errors. Please make sure that you fill in your name correctly on the blue Scantron sheets to minimize any errors. As a safeguard, you should routinely examine your posted exam, quiz, and lab grades on the course Blackboard site during the semester. If you are not satisfied with your final grade for the course, please send me an e-mail. Final Grades will not be changed unless a mathematical error was made during grading.

Lecture topic

Chapter to read in Johnson Textbook (all editions)

Human Biology, Science, and Society
The characteristics of life
The scientific method
The role of science and society
Bioethics–Willowbrook Hepatitis Study, Tuskegee Study

Chapter 1 plus one reading assignment.

Blackboard: read Website on Tuskegee Study.

The Chemistry of Living Things
All matter consists of elements
Atoms, elements, and molecules
Mixtures
Chemical bonding – covalent and non-covalent
Properties of water and hydrogen bonding
pH scale and biochemical buffers
Organic compounds
Carbohydrates
Non-caloric sweeteners
Lipids – fatty acids, triglycerides, phospholipids, and sterols
Proteins and their four levels of structure
Nucleic acids and nucleotides

Chapter 2

Quiz One. Thursday, February 11, 2017

Structure and Function of Cells
Introduction to cells
Eukaryotic cells
The plasma membrane
Diffusion & osmosis
Transport
Cell organelles
Ribosomes
Cell metabolism

Chapter 3.
Making ATP
Aquatic Respiration – glycolysis, Krebs cycle
Mitochondrial electron transport
Anaerobic respiration (Fermentation).
Enzymes

Exam I. Thursday, Feb 23, 2017. Bring your Temple ID and a #2 pencil with eraser. Only information covered in class as of Tuesday, Feb. 21 will be on the exam.

In-class Assignment One. Tuesday, Feb 28, 2017.

Cell Reproduction & Differentiation
The cell cycle creates new cells
Cell Reproduction: One cell becomes two (mitosis)
Apoptosis and necrosis
How cell reproduction is regulated
The Structure of Chromatin – Histones and nucleosomes
TADs and chromatin structure
DNA structure and DNA replication
The Genetic Code
Gene transcription, and protein translation
Exons and Introns
Effect of mutations in DNA.
Transposons
Regulating gene activity – promoters
Cell Reproduction and Differentiation

Meiosis: Preparing for sexual reproduction
Stages of Meiosis
Crossing Over during Meiosis II
Sperm and egg production in humans
Crossing Over during Meiosis II
XX males and XY females and crossing over.
Sperm and egg production in humans
Comparison of mitosis and meiosis
Fertilization and diploid organisms
Comparison of mitosis and meiosis

Genetics and Inheritance
Patterns of inheritance
Law of segregation
Genetic crosses, test crosses
Law of Independent assortment
Multiple effects of single genes
Non-Mendelian inheritance in humans including cytosine methylation
Chromosomes and Human Genetics
Chromosomal basis of inheritance

Human Genetic Analysis
Autosomal Recessive and Autosomal Dominant Disorders
X-linked inheritance
Amelogenesis imperfecta – unusual X-linked recessive disorder.
CAIS, Sex-influenced genes
Aneuploidy, Changes in chromosomal structure
Changes in chromosome number – autosomal and sex chromosomes
Downs syndrome, Turner’s Syndrome, Klinefelter syndrome, etc.

Exam II. Thursday, April 6, 2017. Bring your Temple ID, yourself, and a #2 pencil.

In-class Assignment Two. Tuesday, April 11, 2017

DNA Technology and Genetic Engineering
Classic and Recombinant Biotechnology
Restriction and modification of DNA, RFLP analysis
DNA ligase

Chapter 17.
Chapter 17, Sec. 17.3
Chapter 17, Section 17.3
Chapter 19.
Chap 19, Sec. 19.5 and 19.6
Chapter 20 plus two readings listed below.
DNA plasmids and gene cloning
DNA sequencing
PCR
Forensics, and PCR-based DNA fingerprinting
STRs and VNTRs
CODIS database
Single locus DNA fingerprinting
SNPs,
Gene transfer in animals and plants
Recombinant protein production in Bacteria and Cell Lines
Recombinant vaccines
Human gene therapy
Bioremediation
Cloning of mammalian organisms
Cloning of animals
Embryonic stem cells
Therapeutic cloning, three-parent children.
CRISPR/Cas 9 and gene editing

The Genes of Death. Posted on Blackboard (PP slides)

Read learning module posted on Blackboard under PP slides folder for Chapter 20.

Blood
Components and Functions of blood
Plasma
Hemoglobin and oxygen transport in blood
Blood typing and agglutination
Hemostasis and Blood Clotting
Diseases of the Blood

Heart and Blood Vessels
Blood vessels transport blood
Overview of the circulatory system
The heart: A durable pump
Circulation of blood – systemic and pulmonary circuits
How the heart contracts
How the heart pumps blood, the cardiac cycle
Blood pressure and velocity
Arteries, veins, and capillaries
Hemostasis and blood clotting.
Cardiovascular disorders

The Nervous System: Integration & Control
Structure of neurons, glial cells
Membrane potentials
Action potentials
Chemical synapses
Information pathways
Peripheral nervous system
Central nervous system
Brain structure
The cerebrum
Memory and consciousness
Sensory Systems
Neuropsychiatric diseases and disorders

Final exam not comprehensive. Syllabus topics for each exam are approximate.

9:30-10:50 T R: Thursday May 4 8:00-10:00 AM

Thinking cap
Remember: Don’t miss lab without a valid excuse. Missing two labs without a valid excuse will LOWER YOUR FINAL GRADE BY ONE LETTER GRADE. THREE OR MORE UNEXCUSED ABSENCES FROM LAB WILL RESULT IN A FINAL GRADE OF F FOR HUMAN BIOLOGY.

Remember: If you missed a lecture exam, and have a valid excuse, you will need to make up the exam immediately following the final exam on May 4th, and finish both exams by 10:15 AM. Only one makeup lecture exam can be taken per semester. Makeup exams will most likely include some short answer and completion questions.

Remember: You should bring your Temple ID and a number two pencil for all lecture exams. A pencil sharpener will be available for you to use.

Remember: No makeup quizzes or makeups will be permitted for in-class assignments. If a valid excuse is presented, the quiz grade or in-class asst. grade will be prorated (see example below). All excuses should be scanned, and uploaded to Owlbox (Spring 2017 Excuses – All courses). You need to be invited in order to upload excuse to Owlbox.

**Spring 2017 Academic Calendar**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, January 18</td>
<td>Spring Term Courses begin</td>
</tr>
<tr>
<td>Monday, January 30</td>
<td>Last day to add or drop a Full Term 16-week course</td>
</tr>
<tr>
<td>Monday, March 13-18</td>
<td>Spring Break (no classes held)</td>
</tr>
<tr>
<td>Wednesday, March 22</td>
<td>Last day to withdraw from Spring 2017 semester course</td>
</tr>
<tr>
<td>Monday, May 1</td>
<td>Classes end for Spring 2017 semester</td>
</tr>
<tr>
<td>Tue May 2, Wed May 3</td>
<td>Study Days</td>
</tr>
<tr>
<td>Thursday, May 4 - May 10</td>
<td>Final Exam week</td>
</tr>
</tbody>
</table>

**Example: How a grade is prorated.** Prorate is defined as: to divide, distribute, or assess proportionately. From Medieval Latin word *pro rata*.

Quiz One: 7 of 10 correct 70%

Quiz Two: 8 of 10 correct 80%

Quiz three: Missed quiz, valid excuse was posted on Owlbox.

Quiz three is prorated at 7.5 out of 10 correct with a grade of 75% for quiz three.