

Department: Life Sciences (Biology)

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| General Biology I  Fall 2014  BIOL 1406-0021 CRN# 31232 |

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| Course location and times: | West Loop  Friday 08:00am – 03:00pm Room 162 (Labs) Room C 222 (Lect) |
| Course semester credit hours: | 4 Semester Credit hours |
| Course contact hours: | 96 total hours; 48 hrs lecture, 48 hrs laboratory |
| Course length: | One regular semester |
| Instruction type: | In-person, Lecture-lab; Web-enhanced |

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| Instructor: | Andrei Nesterovitch, PhD. |
| Phone: | NA |
| Email address: | [a.nesterovitch@hccs.edu](mailto:a.nesterovitch@hccs.edu) |
| Office location and hours: | Location - N/A; Office hours – right before and after the class.  Any other time, all GENERAL questions should be addressed to Life Sciences Department Office – Stafford Campus, Scarcella bldg. |

Course Description:

A contemporary course including applications of the scientific method, cellular and molecular biology, biochemistry, classical and human genetics, virology. This course is intended for BIOLOGY MAJORS. The coursework and readings will be geared toward students who intend to pursue biology (or a related discipline) as a major. If you are not majoring in biology (or a related science/health discipline), you may want to enroll in BIOL1308, the first semester of our biology for non-majors sequence.

You are spending a good deal of time, energy and money on this course – please, make the most of your investment! It takes approximately **2-3 hours of study time for each hour of class time to master the material**. This class will have over 96 contact hours (4 hr. credit).

Therefore, the **class and study time necessary to succeed in this class may be close to 350-400 hours (about 25 hours per week)!**

Course Prerequisites:

College reading level as determined by SAT, ACT, TASP; or successfully passing ENGL0305 with a “C” or better.

In our efforts to prepare students for a changing world, students may be expected to utilize computer technology while enrolled in classes, certificate, and/or degree programs within HCCS. The specific requirements are listed below:

**Students are expected to be familiar with standard contemporary MS Office/Internet software (Word, Excel, PowerPoint, Internet browsers, etc.)**

Course Goals:

This course is intended for students majoring in one of the physical sciences or life sciences, engineering, or for students who are pursuing pre-professional programs in medicine, dentistry, pharmacy, veterinary medicine, or other health programs. The course is also beneficial to students who are preparing themselves for higher level science courses in their respective curricula.

**BIOLOGY PROGRAM STUDENT LEARNING OUTCOMES (PSLO):**

Program SLO #1 -

To recognize, identify, and describe the basic structures and functions associated with most life forms.

Program SLO #2 -

To develop basic laboratory techniques appropriate to the field of Biology.

Program SLO #3 -

To develop study skills and habits appropriate for pre-professional students interested in health-related fields.

**STUDENT LEARNING OUTCOMES (SLO):**

The following Student Learning Outcomes with their associated assessment criteria are not meant to be all inclusive, and are meant to be used along with all other course learning outcomes and assessment devices, listed under Course Objectives, in the determination of the student's final course grade. Completion of the specific Student Learning Outcomes listed below, at any assessment grading level, **does NOT and will NOT** guarantee the student that final course grade at the end of the semester!

Bio 1406 SLO#1

The student will be able to recognize the basic structure and describe the function of eukaryotic cellular organelles and cell systems.

**PSLO #1**

Bio 1406 SLO#2

Given a DNA or RNA base sequence, the student will be able to deduce:

a. the sequence of the complementary DNA strand

b. the sequence of the complementary messenger RNA strand

c. complementary codons and/or anticodons

d. the proper amino acid sequence in a peptide by using a supplied table of genetic code.

**PSLO #1**

Bio 1406 SLO#3

The student will be able to explain the synthesis and properties of

a. carbohydrates

b. lipids

c. proteins

d. nucleic acids

**PSLO #1**

Bio 1406 SLO#4

The student will be able to devise an experiment containing the correct experimental test points along with correct positive and negative controls.

**PSLO #2**

Bio 1406 SLO#5

The student will exhibit competence with bringing the brightfield microscope into focus.

**PSLO #2**

Bio 1406 SLO#6

The student will develop the habit of reliable attendance by being absent from class no more than four times per semester.

**PSLO #3**

Bio 1406 SLO#7

The student will demonstrate punctuality in the submission of class assignments on their due date.

**PSLO #3**

**COURSE OBJECTIVES**

1. To establish an understanding of the major historical events in biology and their impact on science.

2. To describe basic cell structure, biochemistry, metabolism, nutrition, reproduction, and genetics .

3. To demonstrate knowledge of the basic principles of cellular inheritance.

4. To demonstrate knowledge of the basic principles of molecular genetic technology.

5. To demonstrate skill in basic laboratory methodology, such as microscopy, and the careful analysis of laboratory data and results.

**CORE CURRICULUM STATEMENT:** Lecture exams, MasteringBiology activities, laboratory practical exams, and class activities will enhance the learning process by giving the student the opportunity to demonstrate the basic intellectual competencies of reading, writing, speaking, listening, and showing critical thinking and problem solving ability.

Tentative Course Calendar:

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| **Aug 29** | **Sep 5** | **Sep 12** | **Sep 19** |
| **Lec**  Course Introduction – Syllabus, Chapter 1  **Lab**  Intro to Lab – Safety Issues; Basic Chemistry | **Lec**  Chapter 2 & 3 (Chemistry and Water)  Chapter 4 (Carbon)  **Lab**  Properties of Water | **Lec**  **Lecture Exam 1 (Ch.1-4)**  Chapter 5 (Large Biomolecules)  **Lab**  Sep 13 - Biochemistry: Detection of Biological Molecules | **Lec**  Chapter 5 & 6 (Large Biomolecules and Cell)  **Lab**  The Microscope  Cell Structure |
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| **Sep 26** | **Oct 03** | **Oct 10** | **Oct 17** |
| **Lec**  Chapter 7 & 8 (Membranes and Metabolism) | **Lec**  **Lecture Exam 2 (Ch. 5-8)**  Chapter 9 (Respiration) | **Lec**  Chapter 9 & 10 (Respiration and Photosynthesis) | **Lec**  Chapter 11 & 12 (Cell Communication and Cell Cycle) |
| **Lab**  Diffusion & Osmotic Relationships of Cells | **Lab**  Diffusion & Osmotic Relationships of Cells | **Lab**  **Laboratory Exam 1** | **Lab**  Enzymes |
|  | **Oct 31 – the last day to drop and receive “W”** |  |  |
| **Oct 24** | **Oct 31** | **Nov 07** | **Nov 14** |
| **Lec**  **Lecture Exam 3 (Ch. 9-11)**  Chapter 13 (Meiosis vs. Mitosis)  **Lab**  Respiration | **Lec**  Chapter 14 & 15 (Genetics)  **Lab**  Photosynthesis & Spectrophotometry | **Lec**  Chapter 16 & 17 (DNA replication and Protein Synthesis)  **Lab**  Cell Division | Lec  Nov.15 - Lecture **Exam 4 (Ch. 12-16)**  Chapter 17 & 18 (Protein Synthesis and Gene Expression)  Lab  Genetics 1 |
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| **Nov 21**  **Lec**  Chapter 19 (Viruses)  Chapter 20 (Biotechnology)  **Lab**  Genetics 2  DNA to Protein | **Dec 05**  **Lecture Exam 5 (Ch. 17-20)**  **Lab**  **Laboratory Exam 2** | **Dec 08 – 12**  **Final Exam (comprehensive)**  **Dec 14: Semester Ends**  **Dec 15: grades due by 12:00 Noon**  **Dec 19: grades available to students** |  |
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**Note that your instructor reserves the right to change the schedule as needed at any point during the course**.

Instruction Methods:

The primary focus of the course will be on instructor lectures including illustrations, animations, group activities and assigned textbook readings, as well as online activities through MasteringBiology System. Lecture material will correspond to the topics covered in the required textbook, but your instructor **may include more detail on certain topics**. Topics and concepts covered during lecture or included in the assigned reading/online activities will be included in exams.

Laboratory sessions will include exercises from our required laboratory manual. Lecture may be included during lab sessions to clarify or detail concepts.

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| Student Assignments: | Students are required to read assigned chapters and to complete chapter quizzes **prior to scheduled lecture**.  Additional announced and unannounced quizzes during lecture or lab may be conducted throughout the semester. |
| Student Assessments: | Students will be assessed via lecture and laboratory examinations, chapter quizzes, comprehensive final lecture and lab examinations. |
| Instructional Materials: | Textbook:  **Biology, 10th Edition, Volume I** by Campbell, Neil, and Reece, Jane; Urry, Lisa; Cain, Michael; Wasserman, Steven; Minorsky, Peter; and Jackson, Robert  **Biology 1406 Laboratory Manual,** by Tom Loesch, Jasleen Mishra, et al. Houston Community College, 3rd edition. Cache House Publishing, 2010-2012  **Online lab practicing** (not mandatory, but FYI) – www.hccs.edu/biologylabs  **MasteringBiology –** an online tutorial, homework, and assessment system for the sciences |

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| HCC Policy Statement: ADA | Any student with a **documented** disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Instructors are authorized to provide only the accommodations requested by the Disability Support Services Office. If you have any special needs or disabilities that may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance.  At Southwest College, contact:  Dr. Becky Hauri  5407 Gulfton Houston, Texas 77081Phone: 713-718-7909 Fax: 713-718-7781 TTY: 713-718-7909 |
| HCC Policy Statement: Academic honesty | Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion. |
| HCC Policy Statement:  Student attendance,  Sexual harassment,  EGLSSS,  Repeaters,  Withdrawal deadline and international students,  Six-drop rule  Safe and secure learning environment | Attendance  Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments.  Instructors check class attendance daily. **A student may be dropped from a course for excessive absences** after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time). Note that 12.5% is approximately 4 classes or labs for a 4-semester hour course.  Habitual tardiness will not be tolerated. Students are expected to be in attendance for the entirety of the scheduled class and are responsible for completing assignments scheduled during their absence/s. It is the responsibility of each student to amend their professional/personal schedule to meet the class schedule.  Sexual harassment  It is a violation of HCCS policy for an employee, agent, or student of the college to engage in sexual harassment as defined in the EEOC guidelines (EEO/AA Compliance Handbook 47).  EGLSSS -- Evaluation for Greater Learning Student Survey System  At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.  Repeaters  Students who repeat a course for a third or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. Please ask your instructor / counselor about opportunities for tutoring / other assistance prior to considering course withdrawal or if you are not receiving passing grades.  Withdrawals, international students, and “Six-drop rule”  Withdrawal from the course after the official day of record (see current catalog) will result in a final grade of “W” on the student transcript and no credit will be awarded. It is the student’s responsibility to initiate and complete a request for withdrawal from any course. Students will be required to formally request a drop from their instructors prior to the administrative drop date deadline (October 31st , 2014, 4:30pm). Abandoning the course or failing to formally drop will result in a grade being given based on the work completed for the entire course (including missed exams).  The State of Texas has begun to impose penalties on students who drop courses excessively. For example, if you repeat the same course more than twice, you have to pay extra tuition. Beginning in fall 2007, the Texas Legislature passed a law limiting first time entering freshmen to no more than SIX total course withdrawals throughout their educational career in obtaining a certificate and/or degree.  Receiving a "W" in a course may affect the status of your Student Visa. Once a W is given for the course, it will not be changed to an F because of the visa consideration. Please contact the International Student Office at 713-718-8520 if you have any questions about your visa status and other transfer issues  Safe and secure learning environment  It is the policy of HCC to provide a safe and secure environment within which learning can take place effectively. Accordingly, disruptive, threatening, or violent behavior in the classroom will not be tolerated. Disruptive, threatening, or violent individuals will be asked to leave the classroom for that day. Failure to comply with this request may lead to removal and/or arrest by the police. This is in addition to any college disciplinary action to which the individual might be liable.  **Student Handbook:**  <http://northeast.hccs.edu/students/student-handbook/Down-load-.pdf> |

Instructor Requirements:

**Basic requirements**

Students should be on time for class and be prepared with required materials including textbook and lab manual. Full class attendance is required including lecture and lab portions. Three tardiness’s for more than 15 minutes each will be counted as one absence. Full attention during lecture and lab is required. If you miss a class, it is your responsibility to obtain notes, assignments, and clarification of missed material from classmates. Students who demonstrated good attendance will get a credit for that (see grading rules below). Partial unexcused absences from a class (leaving classroom without instructor’s permission) will also be considered as “absences”. The instructor reserves the right to take attendance at any time, even several times, during class.

**Phones/electronic devices**

Absolutely no phone or other personal electronic devices are to be used during class (lecture and lab). This includes making or taking a call, reviewing messages, texting, playing games, checking email, surfing the web, anything that involves a phone or other personal electronic device. If your work or family situation requires that you be available via phone, your phone can be on vibrate mode and you can take the call during our regular scheduled breaks or you can exit the class to review the call. Notify your friends, family, employers, and anyone else who regularly contacts you that you will be in class and that you should be contacted only when necessary. The taking of calls during class is not only disruptive but it is also discourteous to classmates and the instructor.

**Testing procedures**

Be sure to arrive early for your examinations. There are time limits for exams. You will not be given extended time for testing if you arrive late.

Exiting the lecture room or lab room is **not permitted once exams have begun. Please be sure to use bathroom before the exam**.

**Department Guidelines:**

Students are expected to conduct themselves as adults. This includes courteous and respectful behavior towards instructor and classmates. Disruptive behavior or any behavior that interferes with any educational activity being performed by the instructor will not be allowed. Additionally, no student may interfere with his/her fellow students’ right to pursue their academic goals to the fullest in an atmosphere appropriate to a community of scholars. Disruptive behavior may result in removal from the class.

**Lab policy**

Lab safety is stated in lab manual. Lab rules and regulations will be discussed during the first lab and will be adhered to at all times. Each student is responsible for cleaning up after labs, this includes glassware, utensils, specimens/models and other material used during lab time (no, clean up is **not covered** by your lab fees).

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| HCC Grading Scale: | A = 90-100%  B = 80-89%  C = 70-79%  D = 60-69%  F = less than 60%  FX - stopped attending class. This is a failing grade which may result in the student having to rapidly repay certain types of government student loans  IF – was given an I and did not finish the required work (automatic after 6 months) |

**Instructor Grading Criteria:**

**Lecture exams**

There will be a total of six lecture exams (five semester lecture exams and a comprehensive final). Each semester exam has equal weight age **(100 pts each).** The comprehensive final exam is **200 pts**. Out of the above five semester lecture exams you have a choice to drop one exam grade. If you miss an exam without any excuse it automatically becomes your drop exam, if you miss two exams it is probably time to withdraw from the course. Otherwise, you will receive an "F" in this course for missing two exams.

**Lab Exams**

There will be 2 lab exams **(125 pts each).** Each exam will consist of questions covered during lab exercises, so it is strongly recommended to stay focused while making your regular lab exercises.

**Make up exams** **MAY** be given only in case of emergency and at the discretion of the instructor. The instructor reserves the right NOT to give make-up exams at all or to give an alternate version of the appropriate test. **Only one make-up exam per semester is allowed** (with proper documentation) and must be arranged with instructor ASAP. There will be NO make up for final comprehensive exam.

**Examination format**

Lecture exams will include multiple choice questions and essay/short answer questions.

Lab exams will include identification, labeling and short answers reviewing lab methods/techniques/approaches.

**Lab Reports (50 pts totally)**The total of **ten** of the laboratory reports will be counted, at up to **five** points each, will serve as an additional major exam grade. Lab reports are due the next laboratory session after the laboratory exercise, or on a due date announced by the instructor. Lab reports must be generally completed as you work on specific exercises in the lab. Grades will be assigned on the basis of accuracy of the information and answering the lab questions, and neatness.

**Extra credit points**

You may add up to **50 points** to your semester score for PowerPoint presentation presented before final exam on topic assigned/approved by your professor.

**Grade Determination:**

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| Your grade will be determined by the following | **Details** | **Points** | **Percent of Final Average** |
| Lecture exams | 5 lecture exams (100 points each); the lowest grade for one lecture exam dropped | 400 | 40% |
| Lab practical exams | 2 lab practical exams, 125 points each | 250 | 25% |
| MasteringBiology activity | 20 chapters, 5 points for each chapter | 100 | 10% |
| Final comprehensive exam | 20 chapters | 200 | 20% |
| Lab reports | 10 reports, 5 points each | 50 | 5% |
| Total: | | 1000 | 100% |
| Extra points | For PowerPoint presentation presented before final exam | 50 | 5% |

## **ASSESSMENT RUBRICS**

## **GENERAL BIOLOGY I - BIOLOGY 1406**

## Performance Factors Rating Scale

F D C B A

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| --- | --- | --- | --- | --- | --- |
| 1] The student will be able to recognize the basic structure and describe the function of eukaryotic cellular organelles and cell systems. **PSLO #1** | Unable to demonstrate knowledge of shape, structure, or function of most eukaryotic cellular organelles. Unable to correlate organelles with their cell systems. | Occasionally able to demonstrate knowledge of shape and structure, or function of a few eukaryotic cellular organelles and cell systems. | Occasionally able to demonstrate knowledge of shape and structure, or function of most eukaryotic cellular organelles and cell systems. | Consistently able to demonstrate knowledge of shape, structure, and function of most eukaryotic cellular organelles and cell systems. | Consistently able to demonstrate knowledge of shape, structure, and function of all eukaryotic cellular organelles and cell systems |
| 2] Given a DNA or RNA base sequence, the student will be able to deduce:  a. the sequence of the complementary DNA strand  b. the sequence of the complementary messenger RNA strand  c. complementary codons and/or anticodons  d. the proper amino acid sequence in a peptide by using a supplied table of genetic code.  **PSLO #1** | Unable to demonstrate knowledge of base pairing rules. Unable to demonstrate the ability to perform replication and transcription and translation, by scenario. | Able to demonstrate knowledge of base pairing rules for DNA only. Able to demonstrate the ability to perform replication by scenario. Unable to demonstrate the ability to perform transcription or translation, by scenario. | Able to demonstrate knowledge of base pairing rules for both DNA and RNA. Able to demonstrate the ability to perform replication and transcription OR translation, by scenario. | Able to demonstrate knowledge of base pairing rules for both DNA and RNA. Able to demonstrate the ability to perform replication and transcription AND translation, by scenario. | Able to demonstrate knowledge of base pairing rules for both DNA and RNA. Able to demonstrate the ability to perform replication and transcription AND translation, by scenario, without error. |

Performance Factors Rating Scale

F D C B A

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| 3] The student will be able to explain the synthesis and properties of  a. carbohydrates  b. lipids  c. proteins  d. nucleic acids  **PSLO #1** | Unable to explain both the synthesis of polymers and the properties of any class of biological macromolecule. | Able to explain the synthesis of polymers, and the properties of any one class of biological macromolecule. | Able to explain the synthesis of polymers, and the properties of any two classes of biological macromolecules. | Able to explain the synthesis of polymers, and the properties of any three classes of biological macromolecules. | Able to explain the synthesis of polymers, and the properties of all four classes of biological macromolecules. |
| 4] The student will be able to devise an experiment containing the proper experimental test points along with proper positive and negative controls.  **PSLO #2** | Consistently cannot differentiate between appropriate and inappropriate experimental design, in practice or by scenario. | Occasionally differentiates between appropriate and inappropriate experimental design, but needs direction to proceed to next step. | Consistently differentiates between appropriate and inappropriate experimental design, but needs direction to proceed to next step. | Consistently differentiates between appropriate and inappropriate experimental design. Attempts to perform some appropriate corrective action or explain some appropriate action; needs some assistance from instructor. | Consistently differentiates between appropriate and inappropriate experimental design. Takes appropriate steps or explains appropriate steps independently and correctly. |

Performance Factors Rating Scale

F D C B A

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| 5] The student will exhibit competence with bringing the bright field microscope into focus.  **PSLO #2** | Consistently unable to find the specimen on the microscope slide, and consistently unable to focus a microscope without the instructor’s help. | Occasionally able to find the specimen on the microscope slide, but consistently unable to focus without the instructor’s help | Occasionally able to find the specimen on the microscope slide, and occasionally able to focus without the instructor’s help | Consistently able to find the specimen on the microscope slide, and occasionally able to focus without the instructor’s help | Consistently able to find the specimen on the microscope slide, and consistently able to focus without the instructor’s help |
| 6] The student will develop the habit of reliable attendance by being absent from class no more than four times per semester.  **PSLO #3** | Is absent frequently enough to interfere with instruction and the completion of the course objectives, and/or is frequently not where he/she is expected to be. Infracts the HCC attendance policies. | When absent, is never aware of the schedule for the day upon return, and must be reminded or encouraged to complete objectives missed during the absence. Is occasionally not where he/she is expected to be. | When absent, is only occasionally unaware of the schedule for the day upon return. Completes objectives missed during the absence only with the help of the instructor and/or classmates, and is where he/she is expected to be at all times. | When absent, independently or with little help completes objectives missed during the absence. Always aware of the schedule for the day, and is where he/she is expected to be at all times. | Is never absent, always aware of the schedule for the day, and is where he/she is expected to be at all times. Consistently and willingly follows HCC attendance policies without being reminded. |
| 7] The student will demonstrate punctuality in the submission of class assignments on their due date.  **PSLO #3** | Is tardy at turn-in frequently enough to interfere with class instruction. Submits assignments two or more weeks late, or ignores assignments. | Is tardy at turn-in frequently enough to interfere with class instruction or submits assignments no more than one week late. | Is occasionally a few minutes late for assignment turn-in. Submits assignments no more than one day late. | Is rarely late for assignment turn-in. Submits assignments late, but on the due date. | Is consistently on time for assignment turn-in. Always submits assignments on the due date. |

Please print this page out, fill it in, and bring to me **NLT September 05th, 2014**

Thank you,

A. Nesterovitch

Biology 1406

Acknowledgement Page

I acknowledge that I have read the syllabus for Biology 1406 and understand the effort and time commitment necessary to succeed in this Science Major Class (up to 300 hours, 60 hr./week) I will prepare for class and perform all exercises and assessments on time and to the BEST of my ability. I understand that I will get the grade I earn, based on my competence in Biology I, as determined by my performance on my work and the Departmental Final Exam.

Safety Guidelines Acknowledgement

I have read and understand the Safety Section in the Lab Manual and agree to follow these and other safety guidelines given to me by my instructors

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student ID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Current Phone # (optional) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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