



SYLLABUS

[BIOL 4061 Biology Research] [Summer 2017]



Instructor:	Dr. George E Brown
Section # and CRN:	P01 30167
Office Location:	430F New Science
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Office Hours:	12:00p.m.-12:50p.m. MTWR Room 103 Students may schedule a tutorial session time with the instructor 7:00p.m.on Monday, Tuesday, Wednesday, or Thursday in room 106. Please make your request either immediately before class begins or during class so that the instructor may announce the session to the entire class.
Mode of Instruction:	[Face to Face]
Course Location:	Room 106 New Science Building
Class Days & Times:	MW 11:00am-11:50am MTWR
Catalog Description:	[Basis of life, cell theory, cell structure, energy transformation, reproduction and genetic variability, and origins of diversity of organisms]
Prerequisites:	Major in Biology
Co-requisites:	[None]
Required Texts:	Assigned research articles from biological journals Class laboratory handouts Videos of research techniques to demonstrate within the limited time techniques that usually require days to perform Selected materials from various graduate biology schools
Recommended Texts:	Reference Text is Campbell Biology, Tenth Edition , by Jane B. Reece, Lisa Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, and Robert B. Jackson ISBN – 13: 978-0321-77565-8 or ISBN – 10: 0-321-77565-1

Supplements: Required Materials

Materials needed to enhance learning biology:

1. Students must read the topics on the e-course for this class prior to class and be prepared to be quizzed by the instructor.
2. Students are required to maintain a notebook with all class handouts, graded exams, reports, and quizzes attached to the notebook.
3. **Number 2 pencils** for exams
4. At least 4 each **SCANTRON forms 884-ES** (Answer choices for 200 questions) for each exam

Student Learning Outcomes:

	Upon successful completion of this course, students will be able to: [NOTE: Begin each outcome with a verb]:	Program Learning Outcome # Alignment	Core Curriculum Outcome Alignment
1	Conduct of laboratory investigations using safe, environmentally appropriate, and ethical practices.		
2	The use of the scientific method during laboratory investigations. You are expected to: <ul style="list-style-type: none"> a. Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting instruments and technology. b. Collect data, organize it, analyze it, evaluate, make inferences, and predict trends. c. Communicate valid conclusions. 		
3	Use critical thinking and scientific problem solving to make informed decisions. <ul style="list-style-type: none"> a. Analyze, review, and critique scientific explanations, including hypotheses and theories using scientific evidence and information. b. Draw inferences based on data. 		
4	Describe the characteristics of living things that distinguish them from non-living things. <ul style="list-style-type: none"> a. Describe the hierarchy of biological organization. b. Contrast the six kingdoms of living things and know examples of each. c. Summarize the role and examples of producers, consumers, and decomposers. 		
5	Demonstrate knowledge of evolution or how sexual reproduction and mutations produce offspring with different genotypes from either parent. Over many generations the survivors can demonstrate new traits that will isolate them reproductively from their ancestors. <ul style="list-style-type: none"> a. Explain the history of how the theory of evolution developed. b. Explain the four premises of evolution by natural selection. c. Explain the synthetic theory of evolution. d. Summarize the evidence for evolution obtained from fossils, comparative anatomy, biogeography, developmental biology, and molecular biology. e. Define and give examples of homology, homoplasy, and vestigial structures. 		
6	Demonstrate knowledge of DNA technologies and genetic engineering.		

	<ul style="list-style-type: none"> a. Demonstrate how restriction enzymes cut DNA molecules and provide examples of how these restriction endonucleases are used in recombinant DNA technology. b. Summarize the properties of plasmids cloning vectors. c. Distinguish between a genomic library and a cDNA library. d. Describe uses for DNA hybridization probes. e. Explain how specific primers are used to amplify (replicate) specific genes from a mixture genomic DNA or cDNA. f. Diagram the dideoxyribo-nucleotide triphosphates method of sequencing DNA. g. Provide a list of important proteins that have been produced by genetic engineering. h. Describe some transgenic plants and animals that been produced. 		
7	<p>Demonstrate by drawings an understanding of gene expression (transcription).</p> <ul style="list-style-type: none"> a. Summarize the early evidence that most genes code for proteins. b. Outline the flow genetic information (central dogma) from DNA to Protein. c. Know the various types of RNA polymerases and how they catalyze the synthesis of RNA. d. Know the substrates and products of transcription. 		
8	<p>Demonstrate knowledge of gene regulation.</p> <ul style="list-style-type: none"> a. Explain the organization of bacterial genes into operons. Explain the function of each gene. b. Explain why some operons are inducible and others are repressible. c. Explain the role of repressors in the regulation of gene expression. d. Differentiate between positive and negative control of operon gene expression. e. Draw the components of a eukaryotic gene and the DNA sequences that are involved in the regulation of transcription of that gene. f. List the types of DNA binding proteins and describe their functions. g. Explain how transcriptional factors (proteins) facilitate transcription. h. Describe how a change in chromosomal structure affects which genes are expressed. i. Explain how one gene in a multicellular eukaryote might be able to produce different products in different types of cells. j. Describe types of regulatory controls that can be exerted in eukaryotes after the mature mRNA is formed. 		
9	<p>Demonstrate knowledge of the human genome and human genetics.</p> <ul style="list-style-type: none"> a. Define human genetics, human genome, bioinformatics, and pharmacogenomics. b. Determine the probable genotypes of the individuals in a pedigree. c. Distinguish between chromosomal abnormalities and single gene defects. d. Draw how non-disjunction may occur during meiosis to cause Down's syndrome, Klinefelter Syndrome, and Turner Syndrome. e. Explain how each of the following genetic defects is inherited: phenylketonuria, sickle cell anemia, cystic fibrosis, Tay-Sachs disease, Huntington disease, color blindness, and hemophilia A. 		

	<p>f. Describe how prenatal diagnosis is made by amniocentesis, chorionic villus sampling and ultra-sound imaging.</p>		
10	<p>Demonstrate an understanding of how the regulation of gene expression controls development of multicellular organisms.</p> <ol style="list-style-type: none"> Distinguish between cell determination and cell differentiation. Describe evidence that demonstrated totipotency (nuclear equivalence) of some differentiated plant and animal cells. Explain the vertebrate cell lineage from zygote to germ layers to adult structures, organs and systems. Distinguish between the function of maternal effect genes, segmentation (zygotic) genes, and homeotic genes of animals. Explain how cell signaling and transcription factors control the order in which genes are expressed during development. Provide some examples of genes that are known to function as genetic switches in development. Define induction and programmed cell death and give examples of the roles they play in development. 		
11	<p>Understand the chemical basis of life.</p> <ol style="list-style-type: none"> Name the principle elements in living things and provide a function of each. Learn the mass, charge, and arrangement of electrons, protons and neutrons in the principle atoms of living things to include the electron orbitals, energy levels, and electron shells. Distinguish between atomic number and atomic mass. Explain how the number of valence electrons of an atom is related to its chemical properties. Compare the mechanisms by which ionic bonds, covalent bonds, and hydrogen bonds are formed. Explain how cations and anions form and how they interact. Distinguish between oxidation and reduction. Show how hydrogen bonds are formed between water molecules and explain how they are responsible for the various properties of water that are essential for life. Convert the hydrogen ion concentration (moles/liter) of a solution to a pH value. Contrast acids, bases, and salts. Describe the composition of salts and why they are important to organisms. 		
12	<p>Explain why the cell is the basic unit of life and describe the cell theory.</p> <ol style="list-style-type: none"> Compare and contrast the characteristics of prokaryotic and eukaryotic cell. Explain why the relationship between surface area and volume of a cell determines its efficiency and entrance into cell division. Describe the structure and function of the various bacterial cell structures. Describe the structure and function of eukaryotic cell structures and organelles. Explain the methods used to study cells. Trace the path of proteins synthesized in the rough endoplasmic reticulum as they are processed, modified and transported to specific destinations. Compare the functions of mitochondria and chloroplasts. Explain the structure and function of microtubules, intermediate filaments, and actin filaments and their importance to cells and animal tissues. 		

	<ul style="list-style-type: none"> i. Describe how flagella, cilia, pseudopods, actin and myosin function in cellular, and animal movement 		
13	<p>Know the phospholipids bilayer structure and function of biological membranes.</p> <ul style="list-style-type: none"> a. Explain the importance of cellular membranes and their functions. b. Explain how the various classes of membrane proteins associate with phospholipids bilayer and discuss the role of each class of proteins. c. Describe the passage of materials through the membranes by diffusion, osmosis, facilitated diffusion, active transport, endocytosis, and exocytosis. d. Understand how cells communicate by cell signaling. e. Demonstrate how cell form tissues and how the various cell junctions connect cells. 		
14	<ul style="list-style-type: none"> 1. Know the laws of thermodynamics that apply energy transformations in living systems. <ul style="list-style-type: none"> a. Know how ATP and GTP are the energy currency of cells. b. Understand how organic catalyst such as enzymes and ribozymes speed up specific chemical reactions in cells. c. Know how the various enzymes function and how they are regulated. 		
15	<p>Know the four stages of aerobic respiration.</p> <ul style="list-style-type: none"> a. Know the enzyme catalyzed reaction steps in stage I of glycolysis and stage II of glycolysis. b. Draw the substrates and products of each step of glycolysis. c. Draw the enzyme, substrate and products of the conversion of pyruvate to acetyl CoA. d. Draw the enzymes, substrates, and products of each step of the citric acid cycle. e. Conceptualize the energy conversions of each step of the electron transport chains and the coupled oxidative phosphorylation. 		
16	<p>Understand photosynthesis.</p> <ul style="list-style-type: none"> a. Know how covalent bonds of water are disrupted during the light dependent reaction and the three products are produced. b. Know how ATP is formed by chemiosmosis. c. Demonstrate by drawing the enzyme catalyzed steps of the Calvin Cycle to include the substrates and products. d. Draw the substrates and products of each step of the synthesis of alpha glucose from two glyceraldehydes 3-phosphate (G3P) molecule. 		
17	<p>Understand chromosomes, mitosis, and meiosis.</p> <ul style="list-style-type: none"> a. Explain chromosomes in terms of genes, loci, heterochromatin, euchromatin, and species number of chromosomes, sister chromatids, centromeres, and kinetochores. b. Describe the principle events of the stages of the eukaryotic cell cycle and how it is controlled. c. Diagram the process of mitosis. d. Draw the process of both stages of meiosis. e. Distinguish between asexual reproduction and sexual reproduction. f. Distinguish between haploid cells and diploid cells. g. Define homologous chromosomes. 		

18	<p>Learn and understand the basic principles of heredity.</p> <ol style="list-style-type: none"> Define and use correctly the terms allele, locus, genotype, phenotype, dominant, recessive, homozygous, heterozygous, monohybrid cross, dihybrid cross, trihybrid cross, and test cross. Apply the product rule and sum rule when predicting the outcomes of genetic crosses. Solve genetic problems involving complete dominance, incomplete dominance, epistasis polygenes, multiple alleles, and X-linked inheritance. Explain some of the ways that genes may interact to affect a phenotype. Explain the genetic determination of sex. 		
19	<p>Understand how the structure of DNA forms the genetic codes for genes.</p> <ol style="list-style-type: none"> Summarize the evidence observed in the 1950's demonstrating that DNA is the genetic material. Draw how the four types of deoxyribo-nucleotide subunits are bonded together to form the structure of DNA. State the base pairing rule for DNA. Draw how the ribo-nucleotide subunits are bonded together to form RNA. Understand DNA transformation of bacteria, and bacteriophage DNA transduction of bacteria. Summarize the evidence that demonstrated semi-conservative replication of DNA. Explain the steps of DNA replication. Know each enzyme involved in DNA replication and its function. Compare the organization of DNA in prokaryotic and eukaryotic cells. 		
20	<p>Demonstrate knowledge of evolution or how sexual reproduction and mutations produce offspring with different genotypes from either parent. Over many generations the survivors can demonstrate (evolve) new traits that will isolate them reproductively from their ancestors.</p> <ol style="list-style-type: none"> Explain the history of how the theory of evolution developed. Explain the four premises of evolution by natural selection. Explain the synthetic theory of evolution. Summarize the evidence for evolution obtained from fossils, comparative anatomy, biogeography, developmental biology, and molecular biology. Define and give examples of homology, homoplasy, and vestigial structures. 		
21	<p>Demonstrate an understanding of the substrates, products, enzymes and ribozymes involved in the steps of translation.</p> <ol style="list-style-type: none"> Identify the features of tRNA that function in decoding the genetic information during translation. Explain how ribosomes function in protein synthesis. Diagram the processes of initiation, chain elongation, and chain termination in protein synthesis. Compare mRNA synthesis, modifications, and ribosome recognition sites in prokaryotes and eukaryotes. 		

Major Course Requirements

Method of Determining Final Course Grade

Course Grade Requirement	Value	Total
1) Exam 1,	16.667%	16.667
2) Exam 2,	16.667%	16.667
3) Exam 3,	16.667%	16.667
Subtotal: 50% of semester grade		
9) FINAL EXAM Grade. Students may earn up to 50% of their semester grade on the final exam.	50.00%	50.00
Total:	100%	100

Grading Criteria and Conversion:]

A = 90% to 100%

B = 80% to 89%

C = 70% to 79%

D = 60% to 69%

F = 0% to 59%

Detailed Description of Major Assignments: [Demonstrate on the cumulative final exam that they can earn scores of between 70% and 100%. Therefore students can earn up to 50% of the semester grade on the final exam.]

Assignment Title or Grade Requirement

Description

Score 70%-100%

Standardized Cumulative Final Exams

Course Procedures or Additional Instructor Policies

I. Type of Course:

This is a comprehensive introduction of the concepts of modern biology research for undergraduate biology majors. It covers biological research techniques, biological journal reading and critiques, the research approach, grant proposal preparation and submission, publication preparation and submission, understanding the most recent biological findings, and identifying the nation's most biological research productive laboratories.

Class Time: 11:00a.m. To 12:00 noon, MTWR

II. Course Purpose and Objectives:

The purpose of this course is to provide undergraduate biology majors with an in depth knowledge of biological research that satisfies the prerequisites for entry into health profession schools and graduate biomedical programs. The **outcome expectations for learners** are listed below in section V. You should read each assigned research paper, class handouts, and class materials and write notes in your **wire binder research notebook** before the instructor teaches the topics in class. Therefore you should be able to perform each of the course **outcome expectations for learners**. Be prepared to ask questions at the beginning of each class about concepts that you did not understand.

The class instructor conducts discussion type classes. These classes require student participation and demonstrations. The instructor will ask students questions, present problems to solve and use audio visuals. You should be prepared to actively participate in class by going to the marker board to demonstrate your knowledge of concepts.

When you meet with your Biology Research instructor for class or study conferences, **have your course notebook and related class materials**. Bring these with you. They will enhance your study sessions.

I. Course Evaluation Methods:

The University's Academic Catalog grading policy is used in this course. **All lecture exams will be cumulative** in terms of biology topics tested on. Unit exams are given. Each exam covers all chapters that had been taught from the first day of class to can day immediately before the exam. The average of all lecture exams and equivalent laboratory exams will constitute fifty percent (50%) of the semester grade. (The average of laboratory practical exams, quizzes, reports, and test will count as an equivalent lecture exam.) **The cumulative final exam will constitute the remaining 50% of the semester grade.**

At least three cumulative exams will be conducted on Wednesdays July 19, 26, and August 2 during the semester. The dates for each exam will be announced at least one week prior to the administration of the exam. However unannounced quizzes may be given by the instructors in order to evaluate how well students are learning the most recent biology concepts taught.

The final exam is scheduled for Wednesday, August 9, 2017 at 11:00a.m.

MAKE-UP EXAMS:

Students are strongly advised to take all exams at the scheduled time. Plan and schedule your activities so that you can be present to take all exams at the scheduled time. Students with non-valid or non-official excuses for missing an exam will earn a grade of zero (0) for the missed exam. Students may request a make-up exam for one that was missed. However, the instructor will schedule the time and place of the make-up exam which will not interrupt the teaching of the class or delay the complete coverage of the course topics. Students that are

scheduled for the make-up exam and miss it will not be provided a second opportunity to take an exam for the original exam missed.

II. Class Attendance:

The University Attendance Policy requires students to be present for each scheduled class. Students are required to demonstrate their knowledge of each concept of modern biology covered by the course textbook and the instructor. Students with or without official excuses for missing class will be tested and evaluated the same as students who were present for class. However, students attending class have the advantage of being taught knowledgeable information which they are expected to know. **Excessive absenteeism will result in the student's grade being reduced.**

III. Semester Calendar:

*Final Exam: 11:00a.m.-1:00 p.m., Wednesday, August 9, 2017.

IV. Conduct That Is Not Allowed:

1. **Cellular phones, I-Pods, Palm pilots, CD players, Radios, Cameras, Lab top Computers** and other sorts of high technology communication instruments are not allowed to be used for any part of this course. These are **instruments for cheating**. If you are carrying these, they **must be turned off** and locked in your book bag during class so that they can not be seen or used. Students that are caught using these or any instruments during class **will be charged with cheating** and therefore earn a failing grade. See item 4 below concerning cheating.
2. **No Smoking.** Smoking is not allowed in the New Science Building.
3. **No Eating in Class:** Food and beverages are not allowed in the classrooms. Do not bring food into the class room.
4. **Cheating on exams, quizzes, reports, or any graded activity is not allowed.** Failing grades (zero) are assigned to students that cheat. **This classroom has video cameras which records the action of students during class exams. These recordings can be used as evidence of student cheating.**
 - a. Please go to the rest room before starting your exam. Once a student leaves the classroom during an exam they will not be permitted to return to that exam.
 - b. Students are not permitted to communicate with each other during an exam. Therefore students can not talk to, pass written materials to, or show answers or questions to other students in the class.
 - c. Laboratory reports and presentations must be the work of the individual student. **Evidence of copying your work from others, including the world wide net, is cheating.**
 - d. **Students should read the section on Offenses and Appropriate Disciplinary Actions on page 80 of the current PVAMU web site catalog.** This is referred to in section XI below.

- e. Students enrolled in this course are not permitted to **wear hats, caps, head rags, helmets or any type of hear gear** in the class rooms for this class. Dress for success. Please do not insult and disrespect the class by violating this cultural practice.

Recommended Student Conduct:

1. Arrive early for class, be seated, and be prepared to participate in class discussions.
2. Eat breakfast and lunch before coming to class.
3. **Dress for success.** Students may also wear medical scrubs and laboratory coats to classes. It is appropriate to wear these in lecture classes because they are worn in the profession of your choice.
4. Start your preparation for the final exam and standardized pre-entry exams such as the MCAT at the beginning of this semester.
5. **Be serious about the final exam.**

Student Support and Success

John B. Coleman Library

The library and its partners have as their mission "to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service" and to support the University's core values of "access and quality, diversity, leadership, relevance, and social responsibility" through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty.

Center for Academic Support

The Center for Academic Support (CAS) offers Tutoring via peer tutoring. The services include workshops (i.e., Save My Semester, Recalculate Your Route), seminars (i.e., Tools You Can Use: T1-84), group review sessions (i.e., College Algebra Topic Reviews, GRE Preparation), group study opportunities (i.e., TSIA, HESI, Study Break, Exam Cram), and test-taking strategies (How to take Notes, Study Buddy, 5 Day Study Guide). The Tutoring Center is a nationally certified tutoring program through the National Tutoring Association. The peer tutors are trained and certified by the coordinator each semester. Location: J.B. Coleman Library

COMPASS

The Center for the Oversight and Management of Personalized Academic Student Success (COMPASS) is designed to help Prairie View students in their second year and beyond navigate towards graduation by providing the following services: Academic Advisement, Targeted Tutorials for Personalized Learning, Campus-Wide Referrals, and Academic & Social Workshops. Location: J.B. Coleman Library

Writing Center

The Writing Center provides student consultants on all aspects of the writing process and a variety of writing assignments. Writing Center consultations assist students in such areas as prewriting, brainstorming, audience awareness, organization, research, and citation. Location: Hilliard Hall 121

University Rules and Procedures

Disability statement (See Student Handbook):

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Disability statement (See Student Handbook):

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

TECHNICAL CONSIDERATIONS

Minimum Recommended Hardware and Software:

- Intel PC or Laptop with Windows 7; Mac with OS X; Smartphone or iPad/Tablet with Wi-Fi
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, Internet Explorer or Firefox

Note: Be sure to enable Java & pop-ups

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet
- Proficiency in Microsoft Word (or a program convertible to Word)
- Proficiency in the Acrobat PDF Reader
- Basic knowledge of Windows or Mac O.S.

Netiquette (online etiquette):

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated.

Technical Support:

Students should go to <https://mypassword.pvamu.edu/> if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Office of Distance Learning at 936-261-3283

Communication Expectations and Standards:

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement:

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it should be copied and pasted to the discussion board.