BIOL-4471-110, CRN 80363, Molecular Biology
Fall 2019
Texas A&M University-Central Texas

COURSE DATES, MODALITY, AND LOCATION
BIOL-4471 is a 16-week Face-to-Face combined lecture and laboratory course. This course uses the A&M-Central Texas Canvas Learning Management System [https://tamuct.instructure.com].
Warrior Hall 316 (Lecture), 8:00 am - 9:15 am TR; Heritage Hall 315 (Lab) 11:15 am - 2:15 pm R

INSTRUCTOR AND CONTACT INFORMATION
Instructor: Hosoon Choi
Office:
Phone:
Email: hchoi@tamu.edu

Office Hours
9:15 am – 11: 15 am R

Student-instructor interaction
Primary Student-instructor interaction will be via email. Students' emails will be checked and be responded daily.

WARRIOR SHIELD
Emergency Warning System for Texas A&M University-Central Texas
Warrior Shield is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in Warrior Shield through their myCT email account.

Connect to Warrior Shield by 911Cellular [https://portal.publicsafetycloud.net/Account/Login] to change where you receive your alerts or to opt out. By staying enrolled in Warrior Shield, university officials can quickly pass on safety-related information, regardless of your location.

COURSE INFORMATION
Course Overview and description: A study of aspects and techniques of modern molecular biology with an emphasis on prokaryotic and eukaryotic gene: structure, function, expression and regulation at transcriptional and post-transcriptional levels. It also incorporates elements of biochemistry, immunology and proteomics that further facilitates understanding of gene function. Three hours of lecture and three hours of laboratory session each week. Prerequisite: BIOL 1407, BIOL 4470
Student Learning Outcomes (SLOs)
Students will:
1. have a clear understanding of the experimental methods used to elucidate the current main theories of molecular biology.
2. understand the molecular/biochemical mechanisms of transcription in both prokaryotes and eukaryotes.
3. be familiar with post-transcription events
4. demonstrate knowledge of mechanism that controls translation
5. have clear understanding of mechanism of DNA replication

6. understand biochemical/molecular basis of homologous recombination
7. be introduced to the rapidly growing fields of genomics and proteomics

Competency Goals Statements (certification or standards)
Required Reading and Textbook(s)

a. Zlatanova, J. and van Holde K. E. 2016. Molecular Biology: Structure and dynamics of genomes and proteomes. Garland Publishing. ISBN: 978-0815345046
b. Carson, S., Miller, H., and Witherow, S. 2012. Molecular Biology Techniques: A classroom Laboratory Manual, 3rd edition. Academic Press. ISBN: 978-0123855442

COURSE REQUIREMENTS

Course Requirements: (include point values for each- not just a percentage)

- Three lecture exams 45%
  Exam 1 (15%); SLOs 1 - 2
  Exam 2 (15%); SLOs 2 - 4
  Exam 3 (15%); SLOs 2 - 7
- Final Comprehensive Exam 25%
  SLOs Demonstrate coherent understanding of comprehensive molecular biological concepts
- Laboratory reports 25%
  SLOs 1 - 7
- Participation 5%
  Attend and actively participate lecture and laboratory class
- Total 100%

Mandatory Laboratory Safety Training:

- All Students are **required** to take the mandatory Laboratory Safety Training Module -found on in your Modules tab in CANVAS.
- You must take the training and **bring the signed "Safety Agreement Form"** to your instructor **before you are allowed in lab!!!**
- The is **YOUR RESPONSIBILITY** – any lab absences because you have not taken the training will be considered **unexcused!**

Grading Criteria Rubric and Conversion

The **final grade** will be calculated from combining points from: Three lecture exams (45% of final grade), final comprehensive exam (25% of final grade), laboratory reports (25% of final grade) and participation (5% of final grade)

Grading scheme

A 4.00 (90% +) Achievement that is outstanding relative to the level necessary to meet course requirements.
B 3.00 (80-89%) Achievement that is significantly above the level necessary to meet course requirements.
C 2.00 (70-79%) Achievement that meets the course requirement in every respect.
D 1.00 (60-69%) Achievement that is worthy of credit even though it fails to meet fully course requirements.
F 0.00 (<60%) Represents failure and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and student that student would be awarded an "I" (incomplete)
I (Incomplete) The "I" shall be assigned at the discretion of the instructor when, due to extraordinary

circumstances, the student was prevented from completing the work of course on time. The assignment of an "I" requires a written agreement between the instructor and student specifying the time and manner in which the student will complete the course requirements. In no event may any such written agreement allow a period of longer that one year to complete the course requirements. For graduate and professional students, an "I" is to remain in the transcript until changed by instructor or department. For all other students, work to make up an "I must be submitted within one year of the last day of final examinations of the term in which the "I" was give; if not submitted by that time, then the "I" will automatically change to F. ***To obtain an incomplete you must have been doing passing work in the course.***

Posting of Grades

The grades will be posted promptly on canvas grade book.

COURSE OUTLINE AND CALENDAR

Week	Topic	Reading	Laboratory Topic
1	Introduction, Genetics, Proteins	Ch 1, 2, 3	Safety Training, BSA Serial Dilutions, NC Spot Test
2	Proteins, Nucleic Acids	Ch 3, 4	Purification & Digestion of Plasmid DNA
3	Recombinant DNA	Ch 5	PCR Amplification of *egfp* from pEGFP-N1; PCR Clean-up & visualization
4	Protein-Nucleic Acid Interaction, Genetic Code	Ch 6, 7	Purification of insert DNA (egfp) PCR product
5	Physical Structure	Ch 8	DNA ligation & Transformation of *E. coli*
	EXAM 1		
6	Transcription	Ch 9, 10	Colony Hybridization
7	Regulation of Transcription	Ch 11, 12	Characterization of Recombinant Clones (Part 1)
8	RNA Processing, Translation	Ch 14, 15	Characterization of Recombinant Clones (Part 2)
9	Translation: The Process	Ch 16	Characterization of Recombinant Clones (Part 3)
	EXAM 2		
10	Regulation of Translation	Ch 17	Expression of Fusion protein, Western Blot (Part 1)
11	Protein Processing and Modification	Ch 18	Expression of Fusion protein, Western Blot (Part 2)
12	DNA Replication in Bacteria	Ch 19	Extraction of Recombinant Protein (Part 1)
	EXAM 3		
13	DNA Replication in Eukaryotes	Ch 20	Extraction of Recombinant Protein (Part 2)
14	DNA Replication in Eukaryotes, DNA Recombination	Ch 20, 21	Thanksgiving
15	DNA Recombination, DNA Repair	Ch 21, 22	Analysis of Purified Fractions
16	**Final Exam**		

Important University Dates

Date	Description
August 12, 2019	Classes Begin for Minimester
August 23, 2019	Classes End for Minimester
August 26, 2019	Classes Begin for Fall Semester
August 26, 2019	Add, Drop, and Late Registration Begins for 16- and First 8-week Classes $25 Fee assessed for late registrants
August 28, 2019	Deadline for Add, Drop, and Late Registration for 16- and First 8-week
September 2, 2019	Labor Day (University Closed)
September 3, 2019	Deadline to Drop First 8-week Classes with No Record
September 11, 2019	Deadline to drop 16-week Classes with No Record
October 1, 2019	Deadline for Teacher Education and Professional Certification Applications
October 4, 2019	Deadline to Drop First 8-week Classes with a Quit (Q) or Withdraw (W)
October 15, 2019	Deadline for Clinical Teaching/Practicum Applications
October 18, 2018	Classes End for First 8-week Session
October 18, 2019	Deadline to Withdraw from University for First 8-Week Classes (WF)
October 21, 2019	Add, Drop, and Late Registration Begins for Second 8-Week Classes $25 Fee assessed for late registrants
October 21, 2019	Classes Begin for Second 8-Week Session
October 21, 2019	Class Schedule Published for Spring Semester
October 22, 2019	Deadline for Faculty Submission of First 8-Week Class Final Grades (due by 3pm)
October 23, 2019	Deadline for Add, Drop, and Late Registration for Second 8-Week Classes
October 25, 2019	Deadline for Graduation Application for Ceremony Participation
October 28, 2019	Deadline to Drop Second 8-Week Classes with No Record
November 4, 2019	Registration Opens for Spring Semester
November 8, 2019	Deadline to Drop 16-Week Classes with a Quit (Q) or Withdraw (W)
November 11, 2019	Veteran's Day (University Closed)
November 28-29, 2019	Thanksgiving (University Closed)
November 29, 2019	Deadline to Drop Second 8-Week Classes with a Quit (Q) or Withdraw (W)
December 13, 2019	Deadline for Applications for Tuition Rebate for Fall Graduation

Date	Description
	(5pm)
December 13, 2019	Deadline for Degree Conferral Applications to the Registrar's Office $20 Late Application Fee
December 13, 2019	Deadline to Withdraw from University for 16- and Second 8-Week Classes
December 13, 2019	Fall Semester Ends
December 13, 2019	Fall Commencement Ceremony
December 17, 2019	Deadline for Faculty Submission of 16-Week and Second 8-Week Final Class Grades (due by 3pm)
December 23, 2019 - January 1, 2020 Calendar Deadlines	

TECHNOLOGY REQUIREMENTS AND SUPPORT

This course will use Canvas Learning management system.

Technology Requirements

This course will use the A&M-Central Texas Instructure Canvas learning management system.
Logon to A&M-Central Texas Canvas [https://tamuct.instructure.com/] or access Canvas through the TAMUCT Online link in myCT [https://tamuct.onecampus.com/]. You will log in through our Microsoft portal.

Username: Your MyCT email address. Password: Your MyCT password

Canvas Support

Use the Canvas Help link, located at the bottom of the left-hand menu, for issues with Canvas. You can select "Chat with Canvas Support," submit a support request through "Report a Problem," or call the Canvas support line: 1-844-757-0953.
For issues related to course content and requirements, contact your instructor.

Other Technology Support

For log-in problems, students should contact Help Desk Central
24 hours a day, 7 days a week

Email: helpdesk@tamu.edu
Phone: (254) 519-5466
Web Chat: [http://hdc.tamu.edu]

Please let the support technician know you are an A&M-Central Texas student.

UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

Drop Policy

If you discover that you need to drop this class, you must complete a Drop Request Form [https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf].

Professors cannot drop students; this is always the responsibility of the student. The Registrar's Office will provide a deadline on the Academic Calendar for which the form must be completed, signed and returned. Once you return the signed form to the Registrar's Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar's Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

Academic Integrity

Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

For more information regarding the Student Conduct process, [https://www.tamuct.edu/student-affairs/student-conduct.html].
If you know of potential honor violations by other students, you may submit a report, [https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=0].

Academic Accommodations

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier-free education. The Office of Access and Inclusion is responsible for ensuring that students with a disability receive equal access to the university's programs, services and activities. If you believe you have a disability requiring reasonable accommodations please contact the Office of Access and Inclusion, WH-212; or call (254) 501-5836. Any information you provide is private and confidential and will be treated as such.

For more information please visit our Access & Inclusion Canvas page (log-in required) [https://tamuct.instructure.com/courses/717]

Important information for Pregnant and/or Parenting Students

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In accordance with requirements of Title IX and related guidance from US Department of Education's Office of Civil Rights, the Dean of Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. Students should seek out assistance as early in the pregnancy as possible. For more information, please visit Student Affairs [https://www.tamuct.edu/student-affairs/index.html]. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these requirements and guidelines online, please visit the website

[http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf].

Title IX of the Education Amendments Act of 1972 prohibits discrimination on the basis of sex and gender–including pregnancy, parenting, and all related conditions. A&M-Central Texas is able to provide flexible and individualized reasonable accommodation to pregnant and parenting students. All pregnant and parenting students should contact the Associate Dean in the Division of Student Affairs at (254) 501-5909 to seek out assistance. Students may also contact the University's Title IX Coordinator.

Tutoring
Tutoring is available to all A&M-Central Texas students, both on-campus and online. Subjects tutored on campus include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111. Tutor.com tutoring **will not** offer writing support beginning August 1, 2019.

If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or have any other question, contact Academic Support Programs at (254) 519-5796, or by emailing Dr. DeEadra Albert-Green at deeadra.albertgreen@tamuct.edu.

Chat live with a tutor 24/7 for almost any subject from on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log in and receive online tutoring support at no additional cost. This tool provides tutoring in over 40 subject areas. Access Tutor.com through Canvas.

University Writing Center
Located in Warrior Hall 416, the University Writing Center (UWC) at Texas A&M University–Central Texas (TAMUCT) is a free workspace open to all TAMUCT students from 10:00 a.m.-5:00 p.m. Monday thru Thursday with satellite hours in the University Library Monday thru Thursday from 6:00-9:00 p.m. This semester, the UWC is also offering online only hours from 12:00-3:00 p.m. on Saturdays.

Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the UWC is here to help!

Students may arrange a one-to-one session with a trained and experienced writing tutor by visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via WCOnline [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu if you have any questions about the UWC and/or need any assistance with scheduling.

University Library
The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition

to the 85,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available 24 hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our Library website [http://tamuct.libguides.com/index].

OPTIONAL POLICY STATEMENTS

A Note about Sexual Violence at A&M-Central Texas
Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at TAMUCT, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Student Counseling (254-501-5955) located on the second floor of Warrior Hall (207L).

Sexual violence can occur on our campus because predators often feel emboldened, and victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the Title IX webpage [https://www.tamuct.edu/departments/compliance/titleix.php].

Behavioral Intervention
Texas A&M University-Central Texas cares about the safety, health, and well-being of its students, faculty, staff, and community. If you are aware of individuals for whom you have a concern, who are exhibiting behaviors that pose a threat to safety, or individuals causing a significant disruption to our community, please make a referral to the Behavioral Intervention Team. You can complete the referral online [https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=2].

Anonymous referrals are accepted. Please see the Behavioral Intervention Team website for more information [https://www.tamuct.edu/student-affairs/bat.html]. If a person's behavior poses an imminent threat to you or another, contact 911 or A&M-Central Texas University Police at 254-501-5800.

INSTRUCTOR POLICIES

Grading Policy and Point Breakdown. Grades in this course will be criteria-based on a number of activities including exams, discussion, and projects. This means that grades will not be curved and anyone achieving a 90% or above will receive an A in this course.

Grade Dispute Policy. Grading disputes must be put in writing (with justification such as supporting statements from the text or another credible source) and given to me no earlier than 24 hours after assignment has been returned. I will consider your request carefully but reserve the right to adjust your grade up or down.

Assignment. All assignments are to be turned in, on time (i.e. at class time on due date), to the Blackboard website.

Late Assignment. I expect all assignments to be turned in on time. Any unauthorized late assignment will receive a 5% reduction in grade for each day it is late.

Exams. The exams will contain 10 short answer questions in a closed-book exam during the class period. You will describe the topics based on the required reading material.

> *There will be no bathroom breaks allowed during any exam. Be sure that you address this issue before beginning an exam.*
>
> *Any student needing to take an exam at a different time as rest of students due to sickness or other accommodations, etc.*

Accommodation exams. All students needing special accommodations must submit an accommodation form from the Office of Access and Inclusion listing the specific accommodations needed. Students are responsible for scheduling their own exam times with the TAMUCT Testing Center.

Missed exams. If you know you will miss an exam, please contact me BEFORE the exam. I will gladly give make-up exams if the student has an unavoidable reason for missing the exam (i.e. death in the family, severe illness). Keep in mind that I expect documentation of your reason for missing the exam (e.g. doctor's note, obituary notice). Exams must be made up within a week of the original scheduled date, no exception regardless of excuse.

Labs. A maximum of 3 absences will be allowed; additional absences in lab will result in an "F" or the entire course, regardless of excuse.

Lab reports. Lab reports are due at the beginning of next laboratory session. Week 15 lab reports due at the begging of final exam.

What I expect of you. To get the most out of this class, you are expected to conduct yourself in a professional manner, which includes contributing to class discussions, being punctual, and notifying me of absences in advance. Any inappropriate or offensive behavior of any kind (in class/lab/office or on assignment/exams) will be subject to a penalty commensurate with behavior.

Class Attendance. I expect that you attend each class session and arrive on time. If an unavoidable situation arises that prevents you from attending class, I expect that you also promptly contact me to discuss the missed material and get the notes from classmate. I will not distribute my notes to students.

What you can expect of me. You can expect me to start and end class on time, be available through office hours, e-mails, be responsive to student suggestions for course improvement, answer questions to the fullest extent possible and/or direct you to appropriate resources, return graded assignments and exams within a reasonable time frame, and treat you with respect as future colleagues.

Copyright Notice

Students should assume that all course material is copyrighted by the respective author(s). Reproduction of course material is prohibited without consent by the author and/or course instructor. Violation of copyright is against the law and Texas A&M University-Central Texas' Code of Academic Honesty. All alleged violations will

be reported to the Office of Student Conduct.

Laboratory Report Rubric

Category	Exceeds expectations	Meets expectations	Below expectations	Does not meet expectations	Score
Abstract	Clearly and consicely states paper's purpose and main results. Includes at least one sentence from each main section. Engaging and thought provoking.	Clearly and consicely states the paper's purpose and main results. Missing 1 section.	States the paper's purpose and main results. Missing 2 or more sections.	Absent, incomplete, or confusing.	5.0%
Introduction	Thoroughly addresses the topic. Engages reader. Logical progression from broad to narrow topic. Clearly states main hypothesis.	The introduction states the main topic and states main hypothesis.	The introduction states the main topic but does not adequately state main hypothesis.	There is no clear introduction of main topic and hypotheis is missing.	10.0%
Materials & Methods	Clear and detailed narrative of methods so reader can replicate study. Materials are included within text (not listed separately). Only essential information included. Mathematical analysis clearly stated.	Clear and detailed narrative of methods so reader can replicate study. Materials are included within text (not listed separately). Mathematical analysis stated.	Narrative of methods not adequately clear so reader can replicate study. Materials are listed separately. Mathematical analysis stated.	Vague narrative of methods. Materials are listed separately or no materials are indicated. No mathematical analysis stated.	10.0%
Results	Clearly and consicely states the results of the study including statistical analysis. Includes appropriate tables/figures to supplement statements. "Just the facts"; no interpretation or discussion of data.	Clearly and consicely states the results of the study including statistical analysis. Includes some tables/figures to supplement statements (may not be appropriate). May have little interpretation or discussion.	States some of the results of the study; missing some statistical analysis. Includes some tables/figures to supplement statements (may not be appropriate). May include interpretation or discussion of data.	Missing some results of the study; missing all statistical analysis. Tables/figures not included or no text included. May include interpretation or discussion of data.	20.0%
Discussion	The conclusion is engaging and restates the main results and thesis. In-depth discussion and elaboration of all sections of the paper. Relates topic back to 'real world' applications.	The conclusion restates the results. Cursory discussion and elaboration of all sections of the paper. Vaguely relates topic back to 'real world' applications.	The conclusion does not adequately restate results or the thesis. Brief discussion of the paper. May not relate topic back to 'real world' applications.	The conclusion does not adequately restate results or the thesis. Incomplete or confusing discussion of the paper. Does not relate topic back to 'real world' applications.	25.0%
Organization/Structural Development of Topic	Writer demonstrates logical and subtle sequencing of ideas through well-developed paragraphs; transitions are used to enhance organization.	Paragraph development present but not perfected.	Logical organization; organization of ideas not fully developed.	No evidence of structure or organization.	5.0%
Spelling/Punctuation	No errors in punctuation, capitalization and spelling.	Almost no errors in punctuation, capitalization and spelling.	Many errors in punctuation, capitalization and spelling.	Numerous and distracting errors in punctuation, capitalization and spelling.	2.5%
Grammar	No errors sentence structure and word usage.	Almost no errors in sentence structure and word usage.	Many errors in sentence structure and word usage.	Numerous and distracting errors in sentence structure and word usage.	2.5%
In-text citations	All facts are cited using primary literature or peer sources. Correct format with no errors	Some facts are cited. Correct format, very few errors.	Few facts are cited. Correct format, few errors	No in-text citations.	5.0%
Literature cited	Correct format with no errors. Includes more than 10 major references (e.g. peer reviewed science journal articles, books, and no more than two professional internet sites. No encyclopedic type references).	Correct format with few errors. Includes more than 5 major references (e.g. peer reviewed science journal articles, books, and no more than two professional internet sites. No encyclopedic type references).	Correct format with some errors. Includes more than 3 major references (e.g. peer reviewed science journal articles, books, and no more than two professional internet sites. No encyclopedic type references).	Not correct format and/or with many errors. Includes more than 0-3 major references (e.g. peer reviewed science journal articles, books, and no more than two professional internet sites. No encyclopedic type references).	5.0%
Figures and tables	Tables/figures numbered consecutively in separate series. Title is complete enough to be understood without referring to text. Legend, headings, and units of measure are included. Footnotes used as necessary to provide clarity with respect to: units of measure that do not fit in the heading, explanations of abbreviations and symbols, statistical significance of entries.	Tables/figures numbered consecutively in separate series. Title is complete. Legend, headings, and units of measure are included. Footnotes used to provide clarity.	Tables/figures numbered, but not sequentially. Title is incomplete. Legend, headings, and units of measure are not fully included. Footnotes used but do not provide enough clarity	Tables/figures not numbered. No title. Legend, headings, and units of measure are not included. Footnotes are not used but are needed.	10.0%
Total					100.0%