



# BIOL 2420 Microbiology (BIOL 2420.003TR & 2420.02ST) Course Syllabus: Spring 2025

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*“Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed.”*

**Professor:** Chris T. McAllister (Dr. Mac) Univ. North Texas, Ph.D.  
**Postdoctoral Fellow in Internal Medicine (VA Medical Center-Dallas)**  
**Office:** UHS Building – Room 163  
**Phone:** 903.434.8286 (voicemail)  
**Email:** [cmcallister@ntcc.edu](mailto:cmcallister@ntcc.edu) (*preferable communication*)  
**Class meets:** MW 11:00-12:20pm (room MS 132)  
**Lab meets:** MW 1:30-2:50pm (room MS 103)

Office Hours	Monday	Tuesday	Wednesday	Thursday	Friday
	9:00-11:00am	8:30-9:30am	9:00-11:00am	8:30-9:30am 1:30-3:30pm	None (off campus-research)

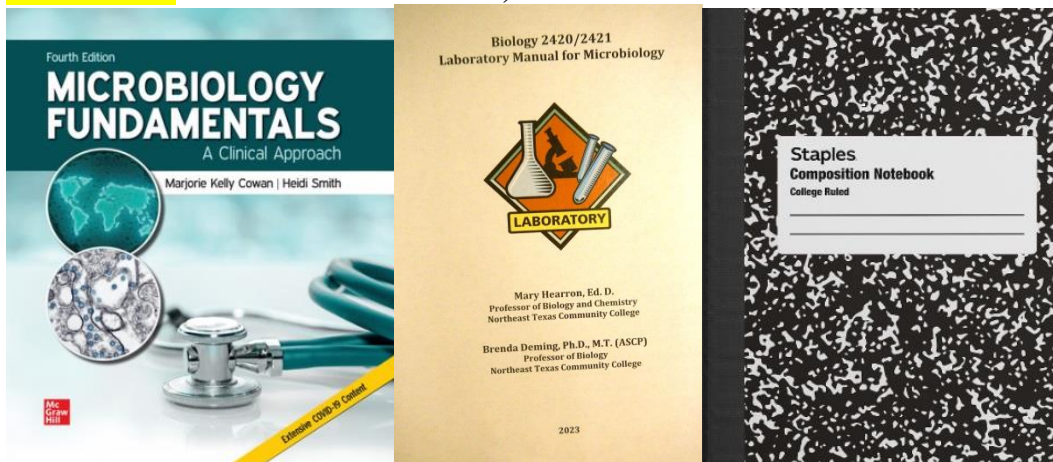
*This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.*

**Disclaimer:** The instructor reserves the right to alter this syllabus as necessary with full disclosure to the student. This syllabus and schedule is articulated as an expectation of class topics, learning activities, and expected student learning. However, the instructor reserves the right to make changes in this schedule at any time that, within his professional judgment, would result in enhanced or more effective learning on the part of the students. These modifications will not substantially change the intent or objectives of this course and will be done within the policies and procedures of NTCC. *This may include the test schedule or topics of discussion in either lecture or laboratory. Should that happen, the student will be notified.*

**Course Description:** 4 Semester Credit Hours. This course covers basic microbiology, immunology, and the basics of culture and identification of bacteria and microbial ecology. This course is primarily directed at pre-nursing, pre-allied health, and non-science majors. This course introduces historical concepts of the nature of microorganisms, microbial diversity, the importance of microorganisms and acellular agents in the biosphere, and their roles in human and animal diseases. Major topics include bacterial structure as well as growth, physiology, genetics, and biochemistry of microorganisms. Emphasis is on medical microbiology, infectious diseases, and public health.  
**Prerequisite(s):** None

## Required Instructional Materials:

**Textbook:** Cowan and Smith, 2022. Microbiology Fundamentals: A Clinical Approach, 4th Edition with Connect **Publisher:** McGraw Hill, **ISBN Number:** 978-1-260-70243-9.



**Lab Manual:** Hearron & Deming, 2023, Biology 2420/21 Laboratory Manual for Microbiology  
**Publisher:** NTCC Bookstore

**Lab Notebook (Journal) Required:** (a bound composition notebook (minimum of 50 sheets with 5 x 5 quads), available just about anywhere (Walmart).

**Minimum Technology Requirements:** Internet Access; Blackboard Ultra, Microsoft Office or Google Suite

**Required Computer Literacy Skills:** To succeed, you will need basic computer skills that include how to use email, attach a document to an email message, navigate web pages, download files, and upload files. You will need to use the Internet to research information. Additionally, you will need a computer with regular access to a reliable Internet connection, a current web browser (such as Chrome [preferably] or Firefox), a technology “back-up” plan in case your primary computer is unavailable.

## COURSE Student Learning Outcomes (SLOs):

1. Describe distinctive characteristics and diverse growth requirements of prokaryotic organisms compared to eukaryotic organisms.
2. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
3. Distinguish between mechanisms of physical and chemical agents to control microbial populations.
4. Explain the unique characteristics of bacterial metabolism and bacterial genetics.
5. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
6. Compare characteristics and replication of acellular infectious agents (viruses and prions) with characteristics and reproduction of cellular infectious agents (prokaryotes and eukaryotes).
7. Describe functions of host defenses and the immune system in combating infectious diseases and explain how immunizations protect against specific diseases.
8. Explain transmission and virulence mechanisms of cellular and acellular infectious agents.
9. Use and comply with laboratory safety rules, procedures, and universal precautions.

10. Perform basic microbiology procedures including proficient use of light microscope, staining techniques, and aseptic techniques for transfer, isolation, quantification, and observation of bacteria.
11. Use different types of bacterial culture media and biochemical tests to grow, isolate, and identify microorganisms.
12. Demonstrate making a wet mount and basic identification protocols based on microscopic morphology of some common fungi and parasites.

**Evaluation/Grading Policy:**

**Lecture Average 50% of final course grade**

The “lecture” component of this course will consist of Connect assignments, weekly quizzes, and exams with the following weight in calculating your final average:

- 10% Connect Assignments
- 10% Weekly Lecture Quizzes (*Half are Bonus*)
- 15% Unit Assessment Exams 1-4
- 15% Final Exam

**Lab Average 50% of final course grade**

The lab component of this course will consist of hands-on activities performed in the laboratory as well as the following:

- 10% **Required** Ectoparasite collection
- 10% **Required** Lab journal
- TBA (Collaborative Homework)*
- 5% *Optional* Class Report
- 10% Unknown Identification Experimental Procedure, Dichotomous Key, and Written Report
- 15% Lab Practicals (Mid-term and Final exam)

**Grading Points (~1,200 points):**

- 100 points – Connect Online Assignments**
- 100 points – Optional Class Report**
- 400 points – 4 Lecture Exams**
- 50+ points – ~10 Weekly quizzes**
- 150 points – Lab Journal (50, 100)**
- 100 points – Collection**
- 200 points – 2 Lab practicals**
- 100 points – 1 Final Exam**

**Grade Assignment:**

- A = 90-100% (900-1,200 pts)**
- B = 80-89% (800-899 pts)**
- C = 70-79% (700- 799pts)**
- D = 60-69% (600-699 pts)**
  
- F = 0-59% (0-599 pts)**

**Connect Online Assignments:**

Each chapter has an assigned Smartbook activity and chapter assignment, and/or chapter quiz to check your understanding of chapter topics and reading assignments. These are completed online in Connect which is accessed through blackboard. You will need to login to blackboard on the 1<sup>st</sup> day of the semester. *Students will work at their own pace prior to the final due date so don't get behind or wait until the last day to complete them.* Activities and Assignments are not timed. **This final due date is firm – no makeups for missed online Connect work will be allowed.** \*See Connect description in the Appendix of Additional Information located on the last page of this syllabus.

**Lecture Material:**

Each week, lectures will be posted on Bb from Powerpoint presentations by your professor. Either print these out and bring to class or have them available on your laptop during class. Study them for exams!

**Regular Lecture Tests/Exams (4):**

The lecture exams may include both objective questions (multiple choice, matching, etc.) over text materials, and readings as well as descriptive questions requiring detailed explanations over broad themes. Success on the exams is a function of anxiety regulation, test prep, study strategies, and studying for retention. Retention requires repetitions, which requires time! The 4 unit exams will be accessed in the classroom setting unless they need to be done in the testing center (which prior approval from Dr. Mac and student services). Each exam is 100 questions worth 100 points. **Tests cannot be made up for any reason without prior communication to your instructor on extreme situations.** Any missed exam will be recorded as a zero (0) and can only be made up with the final exam grade counting twice at the end of the semester to replace the zero. The final exam is worth 200pts (see below). Scantrons are required for each exam. Late arrivals must complete exam by the end of class time. Each exam will have 10 bonus questions over figures or pictures or photomicrographs from the lecture material. A review will be provided for each.

**Final Lecture Exam**

A 100 pt final exam will be given during the time set forth by the college Final Exam Schedule. The final exam will consist of 100 objective questions (multiple choice, matching, etc.) from chapters chosen by your professor TBA. There will be 10 bonus questions as usual. A scantron is required for the final exam. **No makeup for any reason on the final exam.**

**Weekly Quizzes:**

Each week you will take a quiz worth 10 pts (with 2 bonus pts on fill-in-the-blank questions) on lecture material covered the prior lecture period. Every other quiz is entirely bonus, that is, every odd numbered quiz will be worth 12 pts total. Every even numbered quiz counts for a grade against 10 possible pts. **You must be in your seat once the quiz begins to take it.** I will begin the quiz promptly at 11am. If you are late for any reason, you cannot take the exam. Just be punctual to class as this is an excellent way to get bonus points on quizzes done well and helps prepare you for major exams. **Quizzes cannot be made up.** A scantron is needed for each quiz.

**Lab Pre-and-post Reports:**

The lab reports from the lab manual are to be completed **before and/or during lab.** I do not take these up and grade them as these are designed to help you prepare for the Lab Practicals. I will be glad to take a look at your answers and provide feedback/discussion. I strongly advise that you do them each week as they will improve your lab grade.

**Lab Practicals:**

Two lab practicals will be given during the semester. Each is a live exam with stations that students will rotate through and answer mostly multiple-choice questions associated with visuals from lab exercises and handouts from the professor. Visuals may include images, specimens, lab

equipment, data tables, graphs, cultures, microbes, experimental results, etc. A review will be provided for each. ***No makeup for any reason on the lab practicals.***

#### **Required Lab Journal:**

It is a requirement of this course to keep a Non-majors Biology Laboratory Notebook. The notebook will be graded by Dr. Mac at 2 different (announced) times during the semester. First grading is worth 50 pts and the final grading is worth 100 pts. The notebook should be a **bound** composition notebook (minimum of 50 sheets with 5 x 5 quads), available at most bookstores or Walmart. It is worth a total of 150 pts. More in lab on how to keep a good journal.

#### **Required Ectoparasite Collection:**

You are required to keep an ectoparasite collection. It is worth 100 pts. Dr. Mac will cover specs on it in the first lab session. Please take this requirement seriously and have fun doing it. The deadline is toward to the end of the lab section of this course and will be announced. No late collections accepted!

#### **Optional Class Report:**

You will provide an optional special written report in this class on topics provided by the instructor. First come, first serve. This is entirely optional! It will be worth 100 pts. *I do suggest you do it to improve or pad your grade.* More later...

**Cell Phones and Unapproved Electronic Devices:** Absolutely NO video cameras, tape recorders, beepers, MP3 players, I-pods, or other unapproved electronic devices are to be used during class/lab. You may use your lab top. You may also turn your cell phone to a silent buzz (but not during any exam) and excuse yourself from the classroom/lab if you absolutely must answer the call (emergencies only!). Examples would include sick children and/or seniors or other family members who need your immediate help. It is wise to leave your phone in your car on test days!! Students found using their cell phones or other devices during class will **lose 10 pts** from their total class score for each offense. **THIS INCLUDES TEXTING!!** ***Please make it a habit to turn cell phones OFF or on vibrate before class begins each day. Phones are never to be on during any sort of examination. If your phone rings during any exam, you must immediately turn in your exam and receive the grade you earned on all questions whether or not you completed that exam (probably an "F"). No one to blame but yourself!***

**Communications:** NTCC email is the official form of communication used by the college. The instructor will try to respond to student emails within 24 hrs of receipt (except on weekends). **You should NOT expect an immediate response from your instructor in reply to your email.** While I will try to respond in a timely fashion, I do not always have my phone on my person, and I do not have notifications set on my phone to alert me the moment an email arrives in my inbox. (On the weekends it may be up to 48 hrs after receipt of email). Feedback and grades on assignments and postings will be posted 48 to 72 hrs after due date/time of assignment.

**Institutional/Course Policy:** Northeast Texas Community College is a "community of scholars." Please remember that you and all students in this class are pursuing very important goals in your lives. As scholars, I expect every student to be courteous to other students and the

instructor in class and lab as well as in all emails. As your instructor, I will make a conscientious effort to provide you with a variety of teaching and learning formats to help you in your efforts to be successful in microbiology.

I care about your learning experience and your success in this course, however that ultimate success does depend largely on **YOU**. Your success can be maximized and your potential achieved by making the commitment to meet these online expectations:

1. Schedule and plan to complete all lecture and laboratory assignments. Be sure to print off the calendar to help you keep up with Connect assignment due dates. Late assignments are not accepted unless the student can provide a compelling reason for submitting late work. ***No tests or exams may be taken late or made up.***
2. Be sure to do all your own work. Collusion, plagiarism, and use of AI are acts of academic dishonesty.
3. The last day to drop the course with a grade of W is Thursday, **April 10, 2025**. If circumstances require you to withdraw from this course, you must do so by that date. It is the student's responsibility to initiate the withdrawal with the registrar's office. Failure to officially withdraw will result in your receiving a grade of F.

**Alternate Operations During Campus Closure and/or Alternate Course Delivery Requirements** In the event of an emergency or announced campus closure due to a natural disaster, pandemic, or weather-related closure, it may be necessary for Northeast Texas Community College to move to altered operations. During this time, Northeast Texas Community College may opt to continue delivery of instruction through methods that include, but are not limited to, online through the Blackboard Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor NTCC's website (<http://www.ntcc.edu/>) for instructions about continuing courses remotely, Blackboard for each class for course-specific communication, and NTCC email for important general information.

Additionally, there may be instances where a course may not be able to be continued in the same delivery format as it originates (face-to-face, fully online, live remote, or hybrid). Should this be the case, every effort will be made to continue instruction in an alternative delivery format. Students will be informed of any changes of this nature through email messaging and/or the Blackboard course site.

**Statement Regarding the Use of Artificial Intelligence (AI) Technology:**

Absent from a clear statement from a course instructor, use of or consultation with generative AI shall be treated analogously to assistance from another person (collusion). Generative AI is a subset of AI that utilizes machine learning models to create new, original content, such as images, text, or music, based on patterns and structures learned from existing data (Cornell, Center for Teaching Innovation). Unauthorized use of generative AI tools to complete an assignment or exam is not permitted. Students should acknowledge the use of generative AI and default to disclosing such assistance when in doubt. Individual course instructors may set their own policies regulating the use of generative AI tools in their courses, including allowing or disallowing some or all uses of such tools. Students who are unsure of policies regarding generative AI tools are encouraged to ask their instructors for clarification. **(Adapted from the Stanford University Office of Community Standards-- accessed August 31, 2023)**

**NTCC Academic Honesty/Ethics Statement:**

NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

**ADA Statement:**

It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student’s responsibility to request accommodations. An appointment can be made with the Academic Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

**Family Educational Rights and Privacy Act (FERPA):**

The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children’s educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered “eligible students.” In essence, a parent has no legal right to obtain information concerning the child’s college records without the written consent of the student. In compliance with FERPA, information classified as “directory information” may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student’s name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

**Eagle Assist**

At Northeast Texas Community College, we understand that students often need support that extends beyond the classroom. “Eagle Assist” is the place to start when looking for that type of assistance. Our support system is here to help you succeed in both your academic and personal growth. [www.ntcc.edu/eagleassist](http://www.ntcc.edu/eagleassist)

**Services provided:**

- [Mental Health Counseling](#)
- [Classroom Accommodations](#)
- [NTCC Care Center Food & Hygiene Closet](#)
- [Financial Literacy](#)
- [Students with Children](#)
- [Emergency Aid](#)

## Tutoring

Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc.

Mental Health Counseling Services are available on campus- in person and online - to all NTCC students at no cost. If you are experiencing concerns, seeking help is a courageous thing to do. You can also contact us directly at [counseling-center@ntcc.edu](mailto:counseling-center@ntcc.edu)

- Child Care Assistance
- Emergency Aid

Can't find what you are looking for? Send us a message at [eagleassist@ntcc.edu](mailto:eagleassist@ntcc.edu)

Mental Health Counseling Services are available to all NTCC students.

- Visit the following page to get your account activated:  
[www.thevirtualcaregroup.com/ntcc](http://www.thevirtualcaregroup.com/ntcc)

**Tentative Lecture Timeline (\*note\* Professor Mac reserves the right to adjust this timeline at any point for any reason in the term):**

### **BIOL 2420 Dr. Mac's Microbiology Lecture & Important Dates**

M-W	Month	Date	Topics
Week 1	Jan. Jan	20 22	<b>No lecture; MLK Holiday</b> Intro to Micro; Syllabus; History of Micro (Dr. Mac Powerpoint)
Week 2	Jan	27, 29	Chapter 1 Introduction to Microbes & Their Building Blocks
Week 3	Feb	3, 5	Chapter 2 Tools of the lab and Microscopy
Week 4	Feb	10, 12	Chapter 3 Bacteria & The Archaea <b>Exam 1 (Chapters TBA)-Wed., Feb. 12</b>
Week 5	Feb	17, 19	Chapter 4 Eukaryotic Cells and Microorganisms
Week 6	Feb	24, 26	Chapter 5 Viral Structure Chapter 6 Microbial Nutrition & Growth
Week 7	Mar.	3, 5	Chapter 7 Microbial Metabolism <b>Exam 2 (Chapters TBA)-Wed., Mar. 5</b>
Week 8	Mar	10, 12	Chapter 8 Microbial Genetics; Chapter 9 Physical & Chemical Control of Microbes



			<i>SKIP CHAPTER !0</i>
	<b>Mar</b>	<b>17-21</b>	<b>*****SPRING BREAK*****</b>
Week 9	Mar	24, 26	Chapter 11 Interactions Between Microbes & Humans Chapter 12 Host Defenses I: Overview & Nonspecific Defenses
Week 10	Mar	31, Apr. 2	Chapter 13 Host Defenses II: Specific Immunity & Immunization <b>Exam 3 (Chapters TBA)-Wed. Apr. 2</b>
			<i>SKIP CHAPTERS 14 &amp; 15</i>
Week 11	Apr	7,9	Chapter 16 Infectious Diseases Affecting the Skin and Eye Chapter 17 Infectious Diseases Affecting the Nervous System
	<b>Apr</b>	<b>10</b>	<b>Thurs-Last Day to Withdraw</b>
Week 12	Apr	14, 16	Chapter 18 Infectious Diseases Affecting the Cardiovascular and Lymphatic Systems
Week 13	Apr	21, 23	<b>Exam 4 (Chapters TBA)-Mon., Apr 16</b> Chapter 19 Infectious Diseases Affecting the Respiratory System
Week 14	Apr	28, 30	Chapter 20 Infectious Diseases Affecting the Gastrointestinal Tract
Week 15	May	5, 7	Chapter 21 Infectious Diseases Affecting the Genitourinary System
			<b>*Optional report Due (May 5)</b> <b>*All Connect Exercises Due (May 7)</b>
Week 16	May	12-15	<b>FINAL EXAM (Chapters TBA)</b>
	May	16 or 17	NTCC Graduation

**Biology 2420.002TR**  
**Microbiology SPRING 2025 - Tentative**  
**Laboratory Schedule-Dr. Mac**

WEEK	DATE (MW)	LABORATORY ASSIGNMENT
1	Jan. 20	<b>No lab; MLK HOLIDAY</b>
	Jan. 22	Introduction to Microbiology Lab; Lab Safety; Lab Journal;  <i>Discuss Ectoparasite Collection</i>
2	Jan. 27	<b>Safety Quiz 1/27</b> ; Exercise # 2 –Aseptic Transfer of Bacteria and Pure Culture Techniques
	Jan. 29	Exercise # 2 – Aseptic Transfer of Bacteria (con't)

	Feb. 3	Exercise #1 The light microscope
3	Feb. 5	Exercise # 3 – Smear Preparation, Simple Stain & Oil immersion
4	Feb. 10	Exercise 4 – The Gram Stain
	Feb. 12	Exercise 4 – The Gram Stain (con't)
5	Feb. 17	Exercise # 5 – The Acid-Fast Stain
	Feb. 19	Exercise # 6 – The Endospore Stain
6	Feb. 24	Exercise # 7 – Media for Isolation
	Feb. 26	Exercise # 7 – Media for Isolation
7	Mar. 3	Exercise # 9 – Biochemical Differentiation of <i>Staphylococcus sp.</i>
	Mar. 5	Complete Exercise # 9
8	Mar.10	<b>Lab Practical # 1 – Written Labs 1 – 7, Safety, &amp; Colony isolation</b>
	Mar. 12	<b>Lab Practical # 1 Isolation and Gram Staining</b> <b>Turn in lab journal #1</b>
	<b>Mar. 17-21</b>	<b>*****SPRING BREAK*****</b>
9	Mar. 24	Exercise # 10 – Differentiation of <i>Strep &amp; Enterococci</i>
	Mar. 26	Complete Exercise # 10
10	Mar. 31	Exercise # 11 – Biochemical Tests of Carbohydrate Catabolism and Respiration
	Apr. 2	Complete Exercise # 11

11	Apr. 7	Exercise # 12 – Biochemical Tests of Protein Catabolism
	Apr. 9	Complete Exercise # 12; Assign Exercise # 13 & Dichotomous keys
12	Apr. 14	Exercise # 14 - Unknown Identification
	Apr. 16	Exercise # 14 – (con't)
<b>Virtual labs ID of bacterial unknowns #1-10</b>		
13	Apr. 21	Exercise # 14 - Unknown Identification
	Apr. 23	Exercise #14 (con't)
14	Apr. 28	<b>Dichotomous keys due;</b> Exercise # 14 – (con't)
	Apr. 30	<b>Bacterial unknowns quiz due;</b> Exercise # 14 – (con't)
15	May 5	<b>Lab Practical # 2 (labs 7, 9, 10, 11, &amp; 12)</b>
	May 7	<b>*Unknown id report due</b> <b>**Process, complete &amp; turn in ectoparasite collection &amp; final journal due</b>
16	May 12-15	<b>FINAL EXAMS</b>

**DISCLAIMER NOTE:** The instructor reserves the right to alter this syllabus as necessary with full disclosure & prior notice to the student.  
**\*Various assignments on specific dates beyond exams will be given throughout the semester and posted online on Bb.**  
**\*\*Major exam dates are tentative and subject to change, if necessary.**  
**\*\*\*Modifications of the above schedule may be made and the material covered on any exam, including dates for major examinations.**

## Appendix of Additional Information:

### **\*What is McGraw-Hill Connect?**

The McGraw-Hill Connect provides you with access to your eBook. Additionally, within each Connect Folder in Blackboard you will see a link to three different activities: 1) SmartBook, 2) Chapter Assignment, and 3) Quiz.

- 1) **SmartBook assignments are figured into your course grade;** This guided reading helps identify areas that you are having trouble understanding and provides you with some “tutoring” in those areas.
- 2) **Weekly Quizzes are required and figured into the course grade.** Quizzes are usually 12 questions. Please use these quizzes to determine whether you have a true understanding of the material.

**Inclusive Access:** We have negotiated with the Publisher to obtain a discounted price for your lecture course materials. Your ebook and Connect Access Code are included with your tuition and will be available through Blackboard on the first-class day (use the link found on the Bb course homepage). The materials are required for your class and essential in your success. If you also determine that you would like a print copy of your text in addition to your inclusive access loose- leaf copies will be available in the College Store at a discounted price. You may opt out of purchasing your materials from the College Store through the Census Date for the course. If you choose to opt-out you will be responsible for purchasing your Connect Access Code from another vendor. You will receive a refund for the Inclusive Access if you opt out.

Notes: