Biology 2120  
May 2022

Professor: Dr. Stephanie Daugherty  
sdaugherty@uttyler.edu
Office: BEP 107  phone: 903-566-7013
Office Hours: In person: T-Th 8-8:30 & as arranged

Scheduled meeting times: M thru F 8-10:45*
See calendar for details

This course will introduce non-Biology-major, health-professions focused students to the principles of microbiology lab work. Co-registration in BIOL 2320 (Intro to Micro Lecture) is required!

Objectives:

1. Students will learn basic micro lab techniques including sterile technique, inoculations, microscopy, and staining. Lab safety and PPE will be a priority.
2. Students will learn about aerobic respiration, anaerobic respiration, and fermentation, learn how to detect each in test media in the laboratory, and be able to explain the results.
3. Students will learn how enzymes control metabolism and traits in a cell, be able to test for traits in the laboratory with specialized selective & differential media, and be able to explain the results.
4. Students will learn how antibiotics work to target prokaryotes specifically, and how enzymes can confer resistance to antibiotics. Students will conduct an antibiotic sensitivity test and be able to explain the results.
5. Students will learn how antibodies can be used as tools in a diagnostic microbiology lab, and will be able to conduct an antigen detection test and be able to explain the results.
6. Students will develop critical thinking skills, teamwork & communication skills as they complete experiments, data sheets, and group work.
7. Students will receive clinical practice unknown samples that they must identify using their laboratory skills & critical thinking skills.

Lab: Introduction to Microbiology

Materials: Lab Manual printed by department, cost: $31.00 first day of class (cash or check)
1 pack colored pencils (not expensive, should include pink and purple)

Note: this semester this class is designated as in person; lab has a smaller enrollment per class, so we anticipate meeting in person each lab day. This may change as safety needs change. The calendar has been designed accordingly.

Last day to withdraw: May 21, 2022

Class Policies in short:

Follow all safety rules

Respect your colleagues & instructors

Zero–Tolerance for Cheating & Plagiarism

Attendance is expected; if instructor is notified at least 2 hours before online flexibility can be granted for one lab*

Late work policy for uploaded documents: -10% each day for maximum 3 days

Late work policy for quizzes, videos, readings that close at certain time: email to ask for reopening; first one submit planner; rest penalized:
Max score 75% – 2nd
Max score 60% – 3rd … rest 0%
Materials:

**Required:** *Introduction to Microbiology Lab Manual*, by S Fischer, will be available in lab on the first day for $30.00 (cash or check). It is pre-printed by the department and sold just for printing costs to students.

**Online systems:** Canvas (provided through University); Jupiter (provided through instructor as a free system we can use as a clicker/online quiz/etc); Instant feedback program (provided through instructor for activities)

Coursework: (grade weights may be adjusted during semester if unforeseen circumstances require)

**Full list of assignments available on course calendar.**

**Data Sheets:** where experimental or virtual results are recorded and questions about experiment are answered. Then uploaded to online system to be graded. (8% of final grade)

**Lab Readings:** done online ahead of lab, and answer questions to receive credit (same text is provided in hard copy if needed). (8% of final grade)

**Online lab quizzes:** over lab readings & videos, open book, open slides, open notes, open for 1 week prior to due date. Completed on online system (10% of final grade).

**Exams (3 of them):** given in class (or online if safety requires), over lab readings, videos/slides, & data sheets. Reviews will be posted online. Exams will be given on online system, whether in person or not. (16% each for total of 48% of grade)

**Summaries & reviews:** exam reviews will include summaries that will be completed by the student and turned in, and the start of review flashcards to be completed by students, and dichotomous keys to be completed by students (6% of final grade)

**Clinical Practices:** at end of semester, multiple simulated patient samples will be given, and students will use learned lab tests to identify them, fill out data sheets, fill out a report page, and write a summary paragraph which will then be uploaded. (10% of final grade)

**Attendance & Participation:** required attendance in lab (10% of final grade) (or if decided, by performing virtual video experiments, depending on safety needs).

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**UT Tyler grading policy (rounding 0.50 to next percent):**

- 00-59.49% = F
- 59.5-69.49% = D
- 69.5-79.49% = C
- 79.5-89.49% = B
- 89.5-100% = A
**Academic Integrity Policy:** Student dishonesty in this class includes, but is not limited to: plagiarism or failure to cite sources, using another’s words/ideas and claiming as one’s own; use of automated programs to reword copied-and-pasted text to “avoid plagiarism”; turning in another person’s work as one’s own, no matter where it was obtained; signing in another student to attendance records; using or possessing, in lap or hand, an unauthorized (not-in-lockdown) device during an exam; otherwise cheating on an assignment or exam.

Any occurrence of academic dishonesty can result in a score of zero on an assignment, nullification of all extra credit done by the student, failure of the course, and reporting to the Office of Judicial Affairs.

**Comportment:** Students are expected to behave in accordance with University Policy and with safety regulations dictated by the instructor; and behave professionally to not create a disruptive learning environment for fellow students. Tobacco and nicotine products, including e-cigarettes, pose a distraction and potential medical risk to other students, and will not be used in lecture or in lab.

**Absence Policies:**

Students are expected to attend all labs in person (or complete all virtual labs and attend required zooms during Covid-19 online class). These are posted on the calendar students receive at the beginning of the semester, and students are expected to make arrangements to attend every lab class or required zoom session.

In the case of an excused absence, students must submit documentation and let the instructor know as soon as possible prior to the scheduled class.

Multiple absences require documentation through the Student Accessibility Resource office at saroffice@uttyler.edu (903-566-7079) for a plan to accommodate absences and prepare alternative work.

Missed Exams: students who notify the professor with an excused absence ahead of an exam day, complete with required documentation, may be accommodated ONCE with a make-up exam within one week of the absence, which may or may not be in the same format as the scheduled exam (at the instructor’s discretion). If a student misses a class or exam without contacting the instructor ahead of the start of the class or exam, no make up exam or assignment need be offered.

**Late Work & Make-Up Work:** A single missed online or virtual assignment may be made up by any student for full credit by submitting a semester planner that includes both due dates & planned times for working on assignments to the instructor by email (see example in lab book). A second missed assignment may be made up for a maximum of 75% by contacting the instructor within 5 days. A third missed assignment may be made up for a maximum of 60% within 5 days. For uploaded documents or projects, late penalty is -10% every 24 hours for a maximum of 3 days, after which a score of zero will be given. There are no make-up lab sessions for in person labs.

NO EXTRA CREDIT will be offered at the end of semester as a grade adjustment, or to individual students. Extra credit assignments may be given to entire class during the semester, or may be offered for following safety protocols or clean up protocols.
Withdrawals & Incompletes: Make up assignments are provided at the instructor’s discretion, dependent upon the type of assignment, attendance, previous completed assignments, the student’s diligence about contacting the instructor quickly & ahead of the scheduled lab session, and the amount of time elapsed since material was missed. Missing assignments may not be provided after 3 weeks or after an exam is given, depending upon whether materials are pertinent to the next exam. Please email the instructor as soon as possible regarding missed assignments, missed classes or zoom meetings, or required quarantines. Please follow up the email if an answer has not been received within 1 week. If circumstances force a withdrawal from the class, please contact the registrar’s office to formally withdraw from the course by the required date and email your instructor to let them know. If you fail to submit the form on time, you will receive an F in the course. You are not automatically withdrawn if you stop attending classes; you must file the form.

Best Practices & Hints:
- Keep up with Lab Readings, answer questions as you watch them & at the end to receive credit.
- Online Lab Quizzes are open for at least one week; open them early and review the questions, then use class slides, notes, videos & class readings to answer (answers are based on class materials, not outside sources).
- Attend required labs to complete experiments which will be crucial for exams as well as counting for credit. In case of forced absence, notification of the professor ahead of the lab by email is required, with accompanying documentation, for the opening of a virtual lab activity.
- Lab Slides will be presented by the professor, and copies will be posted in the Materials section of Jupiter for students to review and use to answer questions.
- Lab Data Sheets are to be completed by the student from lab experiment results and answering questions from lab reading and lab slides. Students should do their own work to complete the Lab Data Sheets.
- Clinical Practices will be introduced, explained, and completed at the end of the semester, using all students have learned to identify pathogens in prepared “patient samples”

READING IS NOT ENOUGH. PRACTICE TESTING IS CRITICAL. Our Review Materials are specifically designed to make self-testing or study-groups extremely easy.

INTERESTED IN MORE?
The Great Influenza, by John M Barry. Scientist working on Moderna vaccine twitter: @KizzyPhD

<p>| Lab Objective | Student Learning Goals |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>3 factors of molecular interaction</td>
<td>Molecules interact, and their interactions are governed by their charge, hydrophobicity/hydrophilicity, and 3 dimensional shape. Students work as directed with magnets, hydrophobic and hydrophilic powders in water, and puzzle pieces and legos to explore this topic, and learn how to fill in lab data sheets appropriately.</td>
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<tr>
<td>Micro Tools &amp; Labeling</td>
<td>Students learn names of microbiology tools &amp; how to label materials properly</td>
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<td>Streak for Isolation, Inoculations</td>
<td>Students learn what it means to get an “isolated colony”, and learn to streak for isolation from a plate and a “mystery mix” broth. They learn to inoculate broths and keep tools sterile using Bunsen burner.</td>
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<td>Ubiquity</td>
<td>Students culture from common lab locations as well as personal equipment, learn the importance of taking care in a BSL II lab, of not eating or drinking in lab, and also of the dose difference between 1 or 2 bacteria on their pencil, and 1 or 2 million of the same bacteria on a culture plate. Students learn how to dispose of lab materials safely.</td>
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<tr>
<td>Metabolism &amp; Fermentation</td>
<td>Students will observe signs of metabolic processes and waste products produced, in preparation for differential media tests used later in the semester.</td>
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<td>Colony Morphology</td>
<td>Students learn vocabulary and how to classify isolated colonies based upon their morphology and culture conditions.</td>
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<td>Microscopy</td>
<td>Students familiarize themselves with the microscopes and learn how to use them appropriately, how to use immersion oil, and why we use immersion oil.</td>
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<td>Smears &amp; Stains</td>
<td>Students learn to prepare a wet smear and then heat-fix it, and apply a simple stain, and differentiate between bacterial morphologies of their simple stains on the microscope.</td>
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<tr>
<td>Gram Stains</td>
<td>Students learn to prepare a wet smear and then heat-fix it, and do Gram Staining. They must be able to explain what bacterial characteristics determine the result of the Gram Stain, and do several repeatable Gram Stains. They also learn about, but do not do: capsule stains, negative stains, acid-fast stains, and endospore stains.</td>
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<td>Catalase, Coagulase Tests</td>
<td>Students are introduced to direct enzyme tests, in which a substrate is provided and an end product looked for to determine directly whether a specific enzyme is present. Students perform catalase tests and coagulase tests, and are expected to be able to explain the value of both to a patient.</td>
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<td>Gram Positive Tests: MSA</td>
<td>Students learn that once a bacterium is Gram Stained, the Gram Staining characteristic can help determine what further tests should be done. They explore the MSA plate as a differential and selective plate, Bile Esculin, hemolysis, and bacitracin resistance to help determine identify of an unknown Gram Positive bacteria.</td>
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<tr>
<td>HE</td>
<td>be done. They explore the EMB &amp; HE plates as differential and selective plates, and are given “hypothetical” situations to decide which plates to use for food poisoning, sewage leaks, etc.</td>
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<tr>
<td>Other Metabolic Tests: Phenol Red Citrate Oxidation/Fermentation</td>
<td>Students are now familiar with the idea of differentiation tests, and different metabolic processes. These example tests explore the different possibilities to detect enzymatic and metabolic differences between bacterial species.</td>
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<tr>
<td>Lysis Tests</td>
<td>Urea Lysis are utilized here to exemplify hydrolysis tests for bacterial identification. The urea lysis test is important for determining the causative pathogen of prospective UTIs.</td>
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<tr>
<td>Semi-Solid Tests</td>
<td>SIM and Motility tests are utilized here to show how bacterial motility can be assessed, along with indole production and sulfur reduction in the SIM test.</td>
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<td>Antibodies as Tools</td>
<td>Students are introduced to the idea of using antibodies as tools in the laboratory. Students read about using antibody tests to diagnose virus exposure, bacterial exposure, and virus titer. Rapid Antigen Tests are used to demonstrate the use of Antibodies as Tools in the lab.</td>
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<tr>
<td>Genetic Tools</td>
<td>Students are introduced to the idea of using genetic methods as tools in the laboratory. Students read about using genetic tests to identify pathogens such as viruses, bacteria, and parasites. A PCR test is used to demonstrate the use of Genetic tools in the lab.</td>
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<td>Clinical Practices:</td>
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<td>UTI</td>
<td>Students are given 2 simulated “urine” samples and must first determine (utilizing a common dipstick test looking for nitrate reduction to nitrite) likelihood of UTI. In addition, they will learn that not all pathogens of UTI are able to reduce nitrate to nitrite. Then, they will have to determine the likely pathogen causing the UTI using the lab tests they have learned this semester. Students will record results on data sheets, then summarize results in a report form and write a summary paragraph.</td>
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<tr>
<td>Throat culture</td>
<td>Students are given 2 simulated “throat” samples and must first determine likelihood of strep infection using the tests they have learned this semester. Then they must determine the most probable species of strep causing the infection. Students will record results on data sheets, then summarize results in a report form and write a summary paragraph.</td>
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<tr>
<td>4 Mixed Unknowns</td>
<td>Students are given 4 virtual unknowns with accompanying test results and a characteristic key to work through to the likely identity of the virtual bacteria using their lab portfolio.</td>
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Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities
To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php

Campus Carry
We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php

UT Tyler a Tobacco-Free University
All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies
Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester’s Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy
Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services
In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.
Student Absence due to Religious Observance
Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities
If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement
It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation
Everyone is required to exit the building when a fire alarm goes off. Follow your instructor’s directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct
Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. “Cheating” includes, but is not limited to:
   • copying from another student’s test paper;
   • using, during a test, materials not authorized by the person giving the test;
   • failure to comply with instructions given by the person administering the test;
   • possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
   • using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
   • collaborating with or seeking aid from another student during a test or other assignment without authority;
   • discussing the contents of an examination with another student who will take the examination;
   • divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
   • substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
   • paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
   • falsifying research data, laboratory reports, and/or other academic work offered for credit;
   • taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
   • misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.

iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students
• UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
• **UT Tyler Tutoring Center** (903.565.5964), tutoring@uttyler.edu
  The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.

• **UT Tyler Counseling Center** (903.566.7254)

**Important Covid-19 Information for Classrooms and Laboratories**

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by [Procedures for Fall 2020 Return to Normal Operations](#). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff. Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email [saroffice@uttyler.edu](mailto:saroffice@uttyler.edu).

**Recording of Class Sessions**

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.