COURSE DESCRIPTION: An overview of the morphology, physiology, and taxonomy of representative groups of pathogenic and non-pathogenic organisms. Emphasis is placed on applications to humans and techniques used in growing pure cultures of microorganisms on selected media. A brief preview on public health issues is also presented. Designed for non-science majors and allied health students. Credit hours – 4. Contact hours - 3 Lecture, 4 Lab.

PREREQUISITE: Biology 1406 or SCIT 1407.

MATERIALS REQUIRED FOR INSTRUCTION:
REQUIRED:
Scantrons – six 882E – lecture exams - 5, lab exam - 1
Notebook and dividers, Goggles

COURSE OBJECTIVES: This course is divided into 5 lecture units and 3 lab units. All objectives are decided by the district curriculum committee and based on The Texas Higher Education Coordinating Board (THECB) criteria. These objectives are measurable/observable and will be evaluated. Upon successful completion of this course, the listed lecture topics and laboratory activities will be mastered by the student and the student will be able to (orally or in writing) discuss the following:

LECTURE TOPICS
The mechanisms and application of pathogenic organisms
Microbial metabolism, growth, and the control of growth
Study of disinfectants, antiseptics, & antibiotics
The immune system
The study of significant gram positive and gram negative organisms
The mechanisms and application of pathogenic organisms

LABORATORY ACTIVITIES
Proper use of the microscope
Demonstration of aseptic inoculation techniques & procedures
Identification of the morphological characteristics of microorganisms.
Demonstration of staining techniques & procedures
Recognize growth patterns of selected microbes
Demonstration of isolation techniques & procedures
Demonstrated knowledge of Differential/Selected media
Recognize bacterial sensitivity to disinfectants, antiseptics, Ultra violet light, and antibiotics
Perform water quality testing
Discuss the significance of indigenous flora
Perform the identification of unknown microorganisms

STUDENT LEARNING OUTCOMES
1. Students will be able to follow and explain the following important biological processes and analyze the relationship between steps in the process: microbial characteristics, functions, control of microbial growth, and the immune system response to pathogenic organisms.
2. Students will be able to demonstrate the proper use of scientific equipment required to carry out microbiological investigations such as: microscope, micrometers, pipette, pipettors, incubators, and autoclave.
3. Students will be able to demonstrate the proper protocol for various inoculating techniques, isolation techniques, staining microorganisms, and the assessment of differential and selective media.
4. Students will be able to develop and outline major techniques for identifying and classifying unknown microbes.
5. Students will demonstrate various lab tests, analysis of data, collection of data, application of data, and use of resource material.

CORE OBJECTIVES
Critical Thinking Skills - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
Communication Skills - to include effective development, interpretation and expression of ideas through written, oral and visual communication
Empirical and Quantitative Skills - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
Teamwork - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
CLASS PROCEDURES – Successful completion of this course should be accomplished if you do the following:

1. Participation: attend and actively participate in lecture/lab (read the class notes before class, take notes & sketch diagrams during class, ask questions, & study the notes after class daily)

2. Use eCampus: print material, answer all lecture quizzes after the lectures & utilize the lab review material.

3. Create your own study guides for the lecture and lab exams: Use lab manual and textbook, lectures, and internet information and images.

4. Notebook: the notebook should have all course material organized and available. Ex. a table of contents, dividers, course material, & study guides

5. Assignments: To receive credit for your work, you must have YOUR NAME, COURSE & SECTION, STUDENT ID#, DATE, AND INSTRUCTOR’S NAME ON ALL ASSIGNMENTS, and it must handed in by the deadline. LATE WORK IS NOT ACCEPTED.

6. Exams: Lecture exams must be taken on or before the exam deadline. MAKE UP EXAM POLICY: In the event of a missed exam the instructor must be notified within 24 hours of the scheduled exam. If the faculty is not notified the student will receive a zero.

FINAL GRADE IS BASED UPON THE FOLLOWING: lecture exams are worth 40%, lab is worth 55%, and 5% assignment of the total grade.

40% LECTURE EXAMS
35% LAB EXAMS
15% UNKNOWNS
5% PORTFOLIO
5% ASSIGNMENT

LECTURES: LECTURE EXAMS:

- Several lecture exams will be given in the Testing Center (S-2101), the final lecture exam will be administered in the classroom. The Testing Center’s hours are posted on the lab doors or you may call 214-860-8571 for open hours. When using the Testing Center, you will need a student I.D., #2 pencils, and the proper Scantron form (#882E). You MUST use the proper Scantron form.
- Quizzes found on the internet must be completed before the test with resource pages cited.
- Lecture exams must be taken on or before the exam deadline (see course calendar). In the event of a missed exam the instructor must be notified within 24 hours of the scheduled exam and documentation will be required for absence.
- Curve points: will be given to those that have excellent attendance, are not habitually late, and participate in class daily. Do not mark on the exams! Any marks on the exam will result in the loss of the class curve on your exam.
  - Unit I – Turn in a copy of a 4 year degree plan
  - Unit II – Turn in a copy of a Master’s degree plan or Master’s/Ph.D. program
  - Unit III – Obtain a personnel letter of recommendation
  - Recommended: Apply to an internship program or job related to your field of study

LABORATORY:
- Attendance will be taken at the beginning of each class period. ATTENDANCE IS MANDATORY. Instructor Attendance Policy: Students are expected to attend every class and have the responsibility to inform the instructor when an absence occurs. If you must leave class early, you should inform the instructor prior to the start of class.
- Each lab exercise requires full participation for full credit. Instructions are given at the beginning of each lab and WILL NOT be repeated. For your safety, students who miss instruction will not be allowed to participate in lab that day and will lose points for the lab exercise that day.
- You may use gloves, lab coat, and goggles in lab. Please purchase gloves before class.
- Hazardous materials are used in the laboratory areas. Material safety data sheets (MSDS), required by the Occupational, Safety, and Health Administration (OSHA) are available for all students to observe upon request.
- Technology: Please be courteous and respectful. Do not have your cell phones out during class (leave them on vibrate). Texting is not allowed in class. Also, when using your computer in class, please do not check social media until after class.
- Due to insurance and district policy children are not allowed in the laboratory or unsupervised on campus at any time.
- Prohibited behavior: Eating, drinking and open-toed shoes are not allowed in the laboratory at any time.

LABORATORY EXAMS:
- Lab exams must be taken during the scheduled lab exam time. All laboratory examinations are given in the laboratory during class.
- There is a one hour time limit for all lab exams. Exam answer sheets will be provided for the first 2 lab exams.

UNKNOWNs AND LAB EXERCISEs:
- The Unknowns may be considered a cumulative exam of your laboratory procedures and techniques from prior lab assignments.
- Unknown Portfolio – a collection of research materials used for the unknown lab.
- Unknowns must be done in the allotted time as designated on the class calendar and will not be accepted passed the deadline. See the calendar for the date.

INTERNET/RESEARCH ASSIGNMENT:
Using the computer and the internet.
- Assignment – a small group of 4 students will develop an article, poem, or narrative on an organism, disease, or epidemic. The narrative will be submitted to the Writing Center. Further instructions will be given in class and on eCampus.

GRADE POSTING: Grades will be posted on eCampus. Go to the website: http://ecampus.dcccd.edu. Your login is an “e” and your seven digit student identification number (example: e1234567). Your password will be the same as your login. It is strongly suggested that you change your password. Final grades will be on eConnect.

INSTITUTIONAL POLICIES: www.mountainviewcollege.edu/syllabipolicies
MICROBIOLOGY COURSEWORK AND EXAM TOPIC BREAKDOWN

UNIT I
POWERPOINTS & CHAPTERS - 4 (PROKARYOTES), 6 (VIRUSES), AND 5 (SELECTED TERMS- EUKARYOTES: FUNGI, ALGAE, PROTOZOA, & HELMINTHS)

QUIZ QUESTIONS – REVIEW QUESTIONS - CH. 4, 5, & 6
LECTURE EXAM I - 100 TOTAL QUESTIONS, ONE 882E SCANTRON
LAB EXAM I - 49 TOTAL QUESTIONS - 48 WRITTEN QUESTIONS PLUS 1 PRACTICAL EXAM – ASEPTIC INOCULATION TECHNIQUE, ANSWER SHEET PROVIDED

UNIT II
POWERPOINTS & CHAPTERS - 7 (NUTRITION), 11 (MICROBIAL CONTROL), & 12 (SELECTED TERMS-DRUGS)

QUIZ QUESTIONS – CH. 7, 11, & 12
LECTURE EXAM II - 100 TOTAL QUESTIONS, PURCHASE ONE 882E SCANTRON

UNIT III
POWERPOINTS & CHAPTERS - 13 (INFECTION & DISEASE), 15 (SELECTED TERMS- IMMUNITY), & 18 (GRAM + COCCI)

QUIZ QUESTIONS – CH. 13 & 18
LECTURE EXAM III - 100 TOTAL QUESTIONS, PURCHASE ONE 882E SCANTRON
LAB EXAM II – 58 TOTAL QUESTIONS - 57 WRITTEN QUESTIONS PLUS 1 PRACTICAL EXAM - ISOLATION TECHNIQUE, ANSWER SHEET PROVIDED

UNIT IV
POWERPOINTS & CHAPTERS - 19 (GRAM + BACILLI) & 20 (GRAM – BACILLI)

QUIZ QUESTIONS – CH. 19 & 20
LECTURE EXAM IV - 100 TOTAL QUESTIONS, ONE 882E SCANTRON

UNIT V
POWERPOINTS & CHAPTERS - SELECTED TERMS - 21 (BACTERIAL AGENTS), 24 (DNA VIRUSES) & 25 (RNA VIRUSES)

QUIZ QUESTIONS – CH. 21, 24 & 25 (SELECTED ORGANISMS)
LECTURE EXAM TOPIC BREAKDOWN - 100 TOTAL QUESTIONS, PURCHASE TWO 882E SCANTRON,
LAB EXAM III - 57 TOTAL QUESTIONS - 28 WRITTEN QUESTIONS, PRACTICAL EXAM - 29 QUESTIONS OVER IDENTIFICATION AND INTERPRETATION OF INOCULATED DIFFERENTIAL MEDIA AND REAGENTS, ANSWER SHEET PROVIDED AND ONE 882E SCANTRON
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<td>1/21</td>
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<td>1/28</td>
<td>LEC: CHAPTER 4 – PROKARYOTES</td>
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<td>LAB 2: MICROSCOPE FOCUSING P. 119-126, CALIBRATION P. 127-30</td>
<td>LEC: CHAPTER 4 – PROKARYOTES, complete Chapter 4 quiz</td>
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<td>INOCULATION DEMONSTRATION &amp; STEPS, MAKE LABELS</td>
<td>LAB 2: ASEP'TIC TECHNIQUE; NUTRIENT AGAR SLANT, NUTRIENT BROTH, &amp; NUTRIENT AGAR PLATE P. 20-27 COMPLETE QUIZZES</td>
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<td>LAB 3 STAINING TECHNIQUE P. 149-177, PREPARATION OF A SLIDE, SIMPLE</td>
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<td>LEC: CHAPTER 5 – SELECTED EUCARYOTES</td>
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<td>LAB 3: STAINING TECHNIQUES – ENDOSPORE STAIN and ACID-FAST STAIN</td>
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<td>LAB 4: COLONIAL CHARACTERISTICS OF BACTERIA P.55 &amp; 71</td>
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<td>LEC: CHAPTER 11 – MICROBIAL CONTROL</td>
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<td>LAB 6: DIFFERENTIAL MEDIA: P.197; TRIPLE SUGAR IRON P.311, PHENYL RED</td>
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<td>BROTHS P.233, SULFIDE INDOLE MOTILITY P.306-307, CATALASE P.244, LITMUS</td>
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<td>LAB 6: DIFFERENTIAL MEDIA: INTERPRETATION</td>
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<td>LAB 7: BACTERIAL SENSITIVITY: P.101-102</td>
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<td>ULTRAVIOLET RADIATION P. 102-106, CHEMICAL GERMICIDES</td>
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<td>P. 109-114, ANTIMICROBIAL TEST P.365, 371-376</td>
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<td>LEC: CHAPTER 18 – COCCI OF MEDICAL IMPORTANCE</td>
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<td>LAB 8: WATER EXAMINATION P.336</td>
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<td>UNIT II LECTURE EXAM (CH-7, 11, &amp; 12)</td>
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<td>LEC: CHAPTER 19 - GRAM POSITIVE BACILLI</td>
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<td>LEC: CHAPTER 21 – MISCELLANEOUS AGENTS</td>
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<td>LEC: CHAPTER 24 – DNA VIRUSES</td>
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<td>LAB 9: UNKNOWN ORGANISMS – LATE</td>
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**Springs Break – 3/11 - 3/15**

**1/21**

**MONDAY**

- HOLIDAY

**WEDNESDAY**

- LEC: ORIENTATION
  - LAB1: SAFETY, LAB RULES, MICROSCOPE RULES, MSDS VIDEO P.1-5
  - READ PPOINT, BEGIN QUIZZES

**1/28**

- LEC: CHAPTER 4 – PROKARYOTES
  - LAB 2: MICROSCOPE FOCUSING P. 119-126, CALIBRATION P. 127-30
  - INOCULATION DEMONSTRATION & STEPS, MAKE LABELS

**2/4**

- 2/6 CENSUS DATE
  - LEC: CHAPTER 6 – VIRUSES
    - LAB 3 STAINING TECHNIQUE P. 149-177, PREPARATION OF A SLIDE, SIMPLE STAIN

**2/11**

- LEC: CHAPTER 5 – SELECTED EUCARYOTES
  - LAB 3: STAINING TECHNIQUES – ENDOSPORE STAIN and ACID-FAST STAIN

**2/18**

- LEC: CHAPTER 7 – NUTRITION
  - LAB 4: COLONIAL CHARACTERISTICS OF BACTERIA P.55 & 71
  - LAB 5: ISOLATION TECHNIQUES - CLASSNOTES, P. 29-34

**2/25**

- LEC: CHAPTER 11 – MICROBIAL CONTROL
  - LAB 6: DIFFERENTIAL MEDIA: P.197; TRIPLE SUGAR IRON P.311, PHENYL RED BROTHS P.233, SULFIDE INDOLE MOTILITY P.306-307, CATALASE P.244, LITMUS MILK HANDOUT

**3/4**

- LEC: CHAPTER 12 – DRUGS & CHEMOTHERAPY
  - LAB 6: DIFFERENTIAL MEDIA: INTERPRETATION
  - ASSIGNMENT DUE

**3/18**

- LEC: CHAPTER 13 – HUMAN INTERACTIONS
  - LAB 7: BACTERIAL SENSITIVITY: P.101-102
  - ULTRAVIOLET RADIATION P. 102-106, CHEMICAL GERMICIDES P. 109-114, ANTIMICROBIAL TEST P.365, 371-376

**3/25**

- LEC: CHAPTER 18 – COCCI OF MEDICAL IMPORTANCE
  - LAB 8: WATER EXAMINATION P.336
  - UNIT II LECTURE EXAM (CH-7, 11, & 12)

**4/1**

- LEC: CHAPTER 19 - GRAM POSITIVE BACILLI
  - LAB 9: INTRO TO UNKNOWNS, POUR PLATES
  - UNIT II LAB EXAM (LABS 5, 6, 7, & 8)

**4/8**

- LEC: CHAPTER 20 – GRAM NEGATIVE BACILLI
  - LAB 9: ISOLATE - UNKNOWN ORGANISM B & C: UNKNOWN A

**4/15**

- LEC: CHAPTER 20 – GRAM NEGATIVE BACILLI
  - LAB 9: UNKNOWNS – TESTING, PORTFOLIO DUE

**4/22**

- LEC: CHAPTER 21 – MISCELLANEOUS AGENTS
  - LAB 9: UNKNOWNS – TESTING, COMPARISON OF DATA
  - UNIT IV LECTURE EXAM (CH-19 & 20)

**4/29**

- LEC: CHAPTER 24 – DNA VIRUSES
  - LAB 9: UNKNOWN ORGANISMS - ARE DUE
  - UNIT III LAB EXAM (LAB 9)

**5/6**

- LEC: CHAPTER 25 - RNA VIRUSES
  - LAB: LAB EXAM REVIEW

**5/13**

- UNIT V LECTURE EXAM (CH-21, 24, & 25) - IN CLASS