I. INTRODUCTION

A. This course is designed as an introductory course in clinical parasitology, mycology, and virology. Included in this course is a study of the taxonomy, morphology, and pathogenesis of human parasites, fungi, and viruses. The practical application of laboratory procedures as they relate to given disease processes will be discussed.

B. This course is designed to meet curriculum requirements for students in the Medical Laboratory Technician Program at Central Texas College, but may satisfy course requirements for other allied health disciplines.

C. This course is occupationally related and meets the curriculum for Medical Laboratory Technician programs.

D. Prerequisites: MLAB 1201, 1211-Introduction to Clinical Laboratory Science.

II. LEARNING OUTCOMES

Upon successful completion of this course, Parasitology/ Mycology, the student will be able to:

A. List the major considerations in collection, handling, preservation and storage of specimens for identification of intestinal, blood, and tissue parasites.

B. List the general procedure for performing the direct microscopic examination, concentration procedures, and permanent stained smears.

C. Perform the direct microscopic examination and prepare stained smears from concentrated fecal specimens.

D. Describe the life cycle, identify the infective and diagnostic stage, differentiate between stages, and list the vectors and/or intermediate hosts for parasites in the following phyla:
a. Phylum: Sarcomastigophora
b. Phylum: Ciliophora
c. Phylum: Apicomplexa
d. Phylum: Platyhelminthes
e. Phylum: Aschelminthes

E. Identify the stages of parasites in direct wet mounts and stained smears for prepared concentrated fecal specimens.

F. List the general characteristics of pathogenic fungi.

G. Determine acceptability of fungal specimens and select appropriate media for culture of fungal specimens.

H. Describe the appropriate collection procedures, transport, staining methods and culture techniques used in the mycology laboratory.

I. Describe asexual and sexual reproduction of fungi.

J. Identify fungal structures on drawings and 35mm kodachromes.

K. Characterize the following different types of mycoses, defining the tissue they affect: superficial, cutaneous, subcutaneous, systemic, and opportunistic saprobic.

L. Differentiate the etiologic agents of these mycoses.

M. List the characteristics of viruses.

N. Determine acceptable procedures for collection and transport of viral specimens.

O. List the different laboratory methods used in the diagnosis of viral infections.

P. For each of the viral agents, describe how the virus is transmitted or acquired, the infection it produces, and the effective method of laboratory diagnosis.

Q. Relate the clinical significance of laboratory procedures to the appropriate disease process, diagnosis and treatment.

R. Exhibit the professional and ethical attributes required by the laboratory profession.

S. Recognize and use accepted safety precautions for the parasitology, mycology, and virology laboratories.
T. Perform QC procedures for parasitology, mycology, and virology laboratories and evaluate the results.

U. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 70 percent is earned on the written examination covering the material

III. INSTRUCTIONAL MATERIALS:

The instructional materials identified for this course are viewable through www.ctcd.edu/books

Required text:


IV. COURSE REQUIREMENTS

A. To receive transferable credit for this course, you must earn a grade of "C" or better.

B. Class attendance is mandatory in order to receive a passing grade. You will be expected to bring the appropriate materials to class and laboratory sessions.

C. Students with a grade of "C" or less should make an appointment with the instructor to discuss the reason for their low performance.

D. Lecture examinations will be taken from class notes and assigned pages in your text. Any material not understood by the student can be discussed with the instructor privately during office hours. Office hours are posted; please try to schedule an appointment at your convenience.

E. Laboratory examinations will be taken from a combination of lecture and laboratory information. Often theory of procedures is required to perform the procedure and valuate your results.
V. EXAMINATIONS

A. Six lecture examinations and two laboratory examinations will be given. These exams will contain a mixture of multiple choice and written questions. Lab Exams may contain a practical element. A comprehensive final examination will be given.

B. A student must be present for all examinations. Make-up examinations will not be given. Students can replace a zero with their final examination grade. Student who know they will be absent on a test day must take the exam before the scheduled date.

VI. SEMESTER GRADE COMPUTATIONS

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<thead>
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<th>Lecture Examinations</th>
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<tr>
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<td>Quizzes</td>
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<table>
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Total Points: **1200**

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<tr>
<td>Less than 720</td>
<td>F</td>
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NOTE: Cheating in any form will not be tolerated. A student observed cheating will be given a zero on the test. A formal charge may be made to the College Disciplinary Board.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

MLAB 1231
A. **Course Withdrawal:** It is the student's responsibility to officially withdraw from a class, if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file a Central Texas College Application for Withdrawal (CTC Form 59). The withdrawal form must be signed by the student.

CTC Form 59 will be accepted at any time prior to Friday of the 12th week of classes during the 16-week fall and spring semesters. The deadline for sessions of other lengths is:

<table>
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<th>Session Length</th>
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<tr>
<td>10-week session</td>
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<td>8-week session</td>
<td>Friday of the 6th week</td>
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<tr>
<td>5-week session</td>
<td>Friday of the 4th week</td>
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The equivalent date (75% of the semester) will be used for sessions of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of "W", provided the student's attendance and academic performance are satisfactory at the time of official withdrawal.

Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of "F" or "FN" for nonattendance.

B. **Administrative Withdrawal:** An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.

C. **Incomplete Grade:** The College catalog states, "An incomplete grade may be given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course..." Prior approval from the instructor if required before the grade of "I" is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an "F" for the course.

D. **Cellular Phones and Beepers:** Cellular phones and beepers will be turned off while the student is in the classroom or laboratory.

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E. **American’s With Disabilities Act (ADA):** Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DDS) located on the central campus. This service is available to all students, regardless of the location. Explore the website at [www.ctcd.edu/disability-support](http://www.ctcd.edu/disability-support) for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

F. **Instructor Discretion:** The instructor reserves the right of final decision in course requirements.

G. ** Civility:** Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.

VIII. COURSE OUTLINE

A. **Unit One: Introduction, Specimen Collection.**

Upon successful completion of this lesson, the student will be able to:

1. **Learning outcomes:**
   
a. Exhibit a sense of professionalism by demonstrating the following characteristics: attends class regularly and punctually, seeks activities which further learning, admits mistakes and takes steps to correct them, repeats procedures when test result is in doubt, cooperates with instructor, takes pride in laboratory medicine, complies with the stated dress code of the laboratory and recognizes the significance of continuing education activities.
   
b. Demonstrate a basic knowledge of terminology used in Parasitology.
   
c. Identify potentially successful methods for the epidemiologic control of parasitism.
   
d. Describe the primary modes of parasitic transmission.
   
e. Explain and use Standard Precautions and the Blood borne Pathogens Standard in all laboratory work.
   
f. State the purpose and procedure involved when calibrating and using an ocular micrometer.
   
g. Correlate gross and microscopic results with symptoms, diagnosis and other lab results.
   
h. Define key terms necessary to perform Parasitology procedures.
   
i. List the major considerations in collection, handling and processing of Parasitology specimens.
j. List the major considerations in preservation and storage of Parasitology specimens.
k. Recognize potential sources of error in Parasitology laboratory procedures.
l. Demonstrate the proper technique for handling and disposal of contaminated materials.
m. Select proper procedures for performing a routine fecal analysis for the presence of parasites.
n. Demonstrate correct procedures and protocol for quality control measures.
o. Evaluate serologic tests for parasitic infections.
p. For each flagellate and amoeba, describe morphology, life cycle including: infective and diagnostic stage, type of specimen and the procedure for identification.
q. Relate the clinical significance of laboratory procedures and results to the appropriate disease process, diagnosis and treatment.
r. Perform the direct wet mount and stained smear for prepared concentrated fecal specimens. Explain Iodine, MIF, Trichrome, Modified Acid Fast Stain and utilize these to identify organisms.
s. Identify the stages of parasites in direct wet mounts and stained smears for prepared concentrated fecal specimens as well as digital images.
t. Given a case study with pertinent patient information and laboratory data, correctly access the specimen for acceptability and/or identify the responsible organism.
u. Identify all warning signs and labels that indicate hazards for healthcare workers.
v. Describe in detail the general requirements for personal safety and the management of a laboratory accident.
w. Compare and contrast floatation and sedimentation techniques.
x. Define vector. Explain how an arthropod acts as a vector.
y. Explain thick and thin blood smear and it’s diagnostic usefulness.
z. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.

2. **Learning Activities:** Methods of Teaching and Learning
   Students will be taught using various learning methods and activities which includes lectures, demonstrations including hands on with microscope preserved slides, practice sessions, case studies, projects, laboratory exercises, clinical experiences, Internet exercises, quizzes, exams, and recordings. All material covered by these methods may be covered on Exams.

MLAB 1231
Lecture Exam 1

B. Unit Two: Ciliates, Coccidia, Tissue Flagellates and Plasmodium

In addition to the following objectives, students are responsible for all information covered in Unit One.
Upon successful completion Unit Two, the student will be able to:

1. Learning outcomes

   a. For each organism, describe morphology, life cycle including infective and diagnostic stage, type of specimen and the procedure for identification.
   b. Relate the clinical significance of laboratory procedures and results to the appropriate disease process, diagnosis and treatment.
   c. Perform the direct wet mount and stained smear for prepared concentrated fecal specimens.
   d. Identify the stages of parasites in direct wet mounts and stained smears for prepared concentrated fecal specimens as well as digital images.
   e. Given a case study with pertinent patient information and laboratory data, correctly identify the responsible organism.
   f. Describe the procedure used to prepare and stain thin and thick blood smears.
   g. Identify parasites in a stained blood smear.
   h. Differentiate artifact from parasites.
   i. Relate the clinical significance of laboratory procedures and results to the appropriate disease process, diagnosis and treatment.
   j. Describe potential sources of error involved in parasite analysis as well as quality control procedures.
   k. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.

Lecture Exam 2

C. Unit Three: Tapeworms and Flukes

In addition to the following objectives, students are responsible for all information covered in the previous units.

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Upon completion of this unit, the student will be able to:

1. **Learning Outcomes**

   a. List the general characteristics of phylum *Platyhelminthes*.
   b. Define terminology specifically related to *Cestoda*.
   c. Recognize the scientific and common names of cestodes that parasitize humans.
   d. Recognize the methods of diagnosis used to identify cestode infections.
   e. Describe the general morphology of an adult cestode.
   f. Differentiate adult *Cestoda* using morphologic criteria.
   g. Differentiate the diagnostic stages of *Cestoda*.
   h. Given an illustration, photograph, prepared slide, or prepared fecal specimen, identify diagnostic stages of *Cestoda*.
   i. Identify the stage in the life cycle of each cestode that can parasitize humans.
   j. Define terminology specific for flukes.
   k. Recognize scientific and common names of flukes that parasitize humans.
   l. State the methods of diagnosis used to identify fluke infections.
   m. Differentiate adult *Digenea* using morphologic criteria.
   n. Differentiate diagnostic stages of *Digenea*.
   o. Differentiate infective stages of *Digenea*.
   p. Given an illustration, photograph, Kodachrome, prepared slide, or prepared fecal specimen, identify diagnostic stages of *Digenea*.
   q. Discriminate between the *Digenea* on the basis of required intermediate host(s).
   r. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.

**Lecture Exam 3**

**D. Unit Four: Nematodes and Arthropods**

In addition to the following objectives, students are responsible for all information covered in the previous units.

1. **Learning Outcomes:** Upon completion of this unit, the student will be able to:

   a. List the general characteristics of class Nematoda.
   b. Define terminology specifically related to nematodes.
   c. Recognize the scientific and common names of nematodes that
parasitize humans.

d. Recognize the methods of diagnosis used to identify nematode infections.

e. State the body specimen of choice to be used for examination for diagnosis of nematode infections.

f. Describe the general morphology of an adult nematode.

g. Differentiate the adult parasitic intestinal Nematoda.

h. Given an illustration, photograph, Kodachrome, prepared slide or prepared fecal specimen, identify diagnostic stages of Nematoda.

i. Differentiate diagnostic and infective stages of Nematoda.

j. List the characteristics of Arthropods.

k. Define terminology specific for Arthropoda.

l. Identify each class of Arthropoda by morphologic criteria.

m. Contrast the role of Arthropoda as intermediate hosts rather than as transport hosts.

n. Identify the specific genus of Arthropoda serving as the required intermediate host for various helminth and protozoal infections.

o. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.

p. In addition to the following objectives, students are responsible for all information covered in the previous units.

Lecture Exam 4

E. Unit Five: Mycology

1. Learning Outcomes

Upon successful completion of this unit, the student will be able to:

a. List the characteristics of fungi.

b. Describe the diagnostic methods used in the mycology laboratory.

c. Explain the serologic methods available for fungal identification.

d. List the means of classifying fungi. Explain the difference between yeasts and molds.

e. Define relevant terminology.

f. Correlate lab results with diseases and symptoms.

g. State the proper procedure for collection and transport of fungal specimens.

h. Given a case study with pertinent patient information and laboratory data, correctly identify the responsible organism.

i. At the conclusion of this lecture series, the learner will have
achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.

F. **Unit Six: Virology**

1. **Learning Outcomes**
   In addition to the following objectives, students are responsible for all information covered in the previous units.

   Upon successful completion of this unit, the student will be able to:

   a. List the characteristics of viruses.
   b. Describe the diagnostic methods used in the virology laboratory.
   c. Explain the serologic methods available for viral identification.
   d. For each of the viral agents presented, describe how the virus is transmitted or acquired, the type of infection produced, and the effective method of laboratory diagnosis. State the family name and the nucleic and acid type.
   e. List the means of classifying viruses.
   f. Define relevant terminology.
   g. Correlate lab results with diseases and symptoms.
   h. State the proper procedure for collection and transport of viral specimens.
   i. Explain immune globin and its purpose.
   j. List five Hepatitis viruses that infect humans.
   k. List the stages of viral replication.
   l. Given a case study with pertinent patient information and laboratory data, correctly identify the responsible organism.
   m. At the conclusion of this lecture series, the learner will have achieved the following: Achievement will be met when a minimum score of 75 percent is earned on the written examination covering the material.
# MLAB 1231

## Grade Record

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<th>Lecture Exams</th>
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