

Sample Laboratory Course Syllabus

**MET 4117
MOLECULAR DIAGNOSTICS LABORATORY**

**University of Arkansas for Medical Sciences
College of Health Related Professions**

**Department of Laboratory Sciences
Medical Technology**

**Credit Hours - 1 Semester Hour
42 Contact Hours**

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Room 318
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**Spring 2005
(Revised 10/04)**

1.0 GENERAL INFORMATION

1.1 Catalog Description

Laboratory for Molecular Diagnostics MET 4217. Emphasis will be placed on basic molecular techniques such as DNA extraction and quantitation, restriction enzyme digestion, polymerase chain reaction and agarose gel electrophoresis.

1.2 Course Rationale

The goal of this course, as the laboratory component of Molecular Diagnostics MET 4217, is to teach students the necessary skills to perform competently at the bench in a molecular diagnostic laboratory. Emphasis will be placed on basic molecular techniques such as DNA extraction and quantitation, restriction enzyme digestion, polymerase chain reaction and agarose gel electrophoresis.

1.3 General Course Objectives

This course is designed to provide students with the basic skills necessary to perform competently in a molecular diagnostics laboratory. Principles, sources of error, problem solving and interpretation of basic molecular techniques will be emphasized.

Affective objectives for this course are:

1. Comply with biosafety regulations by practicing proper disposal of biohazardous material, as evidenced by complying with established safety regulations.
2. Exhibit interest in the laboratory assignments and lecture discussions by participating.
3. Help maintain a neat, clean, and orderly work area in all the laboratories without being asked.
4. Demonstrate proper care and use of laboratory equipment, as evidenced by lack of breakage.
5. Attend classes regularly and be punctual.
6. Demonstrate preparedness for the laboratory by following directions and completing the tasks assigned with little need for additional instructions.
7. Cooperate by communicating with and helping other students.
8. Exhibit assurance and confidence in performing laboratory tasks.
9. Demonstrate integrity by recognizing and repeating questionable tests.

10. Act responsibly.
11. Accept instruction and constructive criticism maturely.
12. Show respect for other students, instructors, and patients.
13. Comply with the stated dress codes.

2.0 INSTRUCTIONAL METHODOLOGY

2.1 General Techniques

The following general teaching techniques will be used:

- Laboratory
- Demonstration
- Practice
- Audiovisual
- Review questions and sessions at the beginning of each laboratory

3.0 INSTRUCTIONAL MATERIALS/SUPPLIES

3.1 References

There is no required textbook for Molecular Diagnostics Laboratory. A course booklet containing laboratory worksheets, protocols and other useful information will be distributed to the students at the beginning of the course. Sources for this booklet include several textbooks, internet resources, vendor educational materials and protocols from clinical laboratories. Pertinent textbooks will be put on reference in the library for student additional reading.

4.0 GENERAL EVALUATION PROCEDURES

4.1 Student Evaluation Procedures

Two practical examinations are scheduled throughout the course. Home work assignments and data sheets for each laboratory are also submitted for grading.

Raw score points will be accumulated from the practical examinations, laboratory work sheets, and pop quizzes. A final percent score will be determined by dividing this total by the total number of points possible. The overall course score will be based on the percentage of total possible points.

The final letter grade will be derived as follows:

<u>Letter grade</u>	<u>Minimum % Score</u>
A	93
B	85
C	77
D	69
F	<69

If you feel in need of a conference with an instructor, at any time during the course, do not hesitate to request an appointment with the appropriate instructor. By the same token if the instructors determine that you are having academic difficulty, they will initiate a conference with you.

4.2 Instructor Evaluation Procedures

Students will evaluate the instructors using the CHRP Instructor Evaluation Form which cover the areas of knowledge, organization, instructional skill, and enthusiasm.

Course Evaluation

A course evaluation will be completed by each student.

4.3 Performance, Laboratory, Clinic, and Project Evaluation

There are 14 laboratory sessions designed to introduce techniques and correlate principles and concepts with laboratory procedures. Students will be asked to discuss their findings and the interpretations with a laboratory instructor each day. See schedule for dates of the two practical examinations.

- A. **Preparation** - The laboratory outline will list the new procedures to be performed. Students will be expected to come to class each day having read over the laboratory instructions and procedures for the scheduled laboratory. It is the students responsibility to meet all of the objectives.
- B. **Time** - Laboratories are scheduled for three hour periods. Instructions for each laboratory will be given at the beginning of the period.
- C. **Safety** - **NO EATING OR SMOKING IS PERMITTED IN THE LABORATORY. WASH YOUR HANDS** before leaving the laboratory. Gloves and laboratory coats will be required for all laboratories. Universal precautions will be observed.

D. **Worksheets** - It is suggested that the students keep their laboratory worksheets and problem solutions for review prior to written examinations.

4.4 Makeup and Retake Examinations

Practical examinations, pop quizzes and laboratory worksheet points may not be made up. Retake examinations are not permitted.

5.0 **GENERAL PROCEDURES**

The course consists of 14 laboratory sessions of 170 minutes each. Students will be required to turn in worksheets and study questions for grading. Learning objectives for laboratory sessions are included in the laboratory manual.

6.0 **CLASS ATTENDANCE/CONDUCT/DRESS POLICY**

6.1 General Remarks

Attendance is required in **ALL** laboratory sessions. In case of emergency absence, the student is to notify the MT Department office, (501) 686-5776.

6.2 Session Absence Grading Effects

It is the student's responsibility to obtain the material presented in the laboratory that has been missed. **LABORATORY SESSIONS CANNOT BE MADE UP.**

6.3 Session Tardiness Grading Effects

Students should be prompt. Pop quizzes underway or completed before a student enters the classroom and/or laboratory cannot be made up.

6.4 Conduct/Dress

Medical technology students will wear laboratory coats in all laboratory sessions. Gloves will be provided for students to wear when working with potentially infectious materials.

7.0 **DUE DATE/DEADLINES**

There are two practical examinations. One is scheduled at approximately midterm and the other at the end of the semester.

8.0 **SESSION SCHEDULE**

Refer to schedule for times and room numbers.

9.0 INSTRUCTIONAL STAFF

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10.0 POLICIES

CHRP Copyright Policy and Disability Policy

“The materials used in this course may include copyright protected materials provided for the personal educational use of the enrolled students and may not be further redistributed.”

“The CHRP disability policy is available upon request.”

Tentative Molecular Diagnostics Laboratory Schedule

- Laboratory 1: DNA isolation from peripheral blood
- Laboratory 2: Nucleic acid quantitation
- Laboratory 3: DNA isolation and quantitation from buccal swabs
- Laboratory 4: Restriction enzyme digestion and agarose gel electrophoresis I
- Laboratory 5: Restriction enzyme digestion and agarose gel electrophoresis II
- Laboratory 6: Polymerase chain reaction (PCR) for Hepatitis B virus I
- Laboratory 7: Polymerase chain reaction (PCR) for Hepatitis B virus II
- Laboratory 8: Laboratory Practical I
- Laboratory 9: DNA sequencing – dry laboratory
- Laboratory 10: Test for Hereditary Hemochromatosis (HH) by PCR/RFLP I
- Laboratory 11: Test for Hereditary Hemochromatosis (HH) by PCR/RFLP II
- Laboratory 12: Test for Factor V Leiden - SNPCapture™ ELISA kit I
- Laboratory 13: Test for Factor V Leiden - SNPCapture™ ELISA kit II
- Laboratory 14: Histocompatibility testing dry laboratory
- Laboratory 15: Laboratory Practical II