

**SAULT COLLEGE**  
**of Applied Arts and Technology**  
**Sault Ste. Marie**

**COURSE OUTLINE**

MEDICAL LABORATORY TECHNOLOGY

MED 106-4

MICROBIOLOGY

r6VIS6CJ     June, 1980 by D. Heqgart

MEDICAL LABORATORY TECHNOLOGY

MED 106-4

MICROBIOLOGY

SEMESTER 2

INTRODUCTION:

Theory

MED 106 is designed to acquaint students lacking previous experience in microbiology with the characteristics of micro-organisms and their status and function as a normal, interacting component of the biosphere. Application: Theoretical aspects in microbiology are then specified in terms of (particularly) human disease and product deterioration, and means of modifying microbial activities to the benefit of mankind are studied with emphasis on medical application. Practical: Laboratory exercises are designed both to give the student immediate experience in techniques for manipulation of micro-organisms and use of appropriate equipment and instruments, and in valid application of basic scientific methods as applied to microbiology.

TEXT:

General Microbiology - The Student's Textbook, 1977, The C. V. Mosby Company, by Hunter, Peter.

EVALUATION:

Student performance is evaluated on the basis of three lecture examinations of one hour each, two laboratory quizzes of one-half hour, quality of laboratory notebook and a special project involving techniques and principles of microbiology.

Biologic Position of Micro-organisms

- relate position of microorganisms to other organisms in terms of phylogenetic development
- explain how organisms are identified and named and narrowed-down to micro-organisms
- characterize various classes of micro-organisms with respect to reproduction and metabolism and make the appropriate intracomparisons
- consider the importance of microbial activities to those of humans, positive and negative, and review importance with respect to various fields of applied microbiology.

History of Microbiology

- review history of microbiology indicating clearly the important advances and their value.

Structure of Microorganisms

- detail general structure patterns of the various kinds of microorganisms
- relate microbial structure of that of higher organisms directly and with respect to metabolism and energy requirement.
- review and evaluate means of determining structure and implications and practical application of each.

Ecology

- clearly establish the place of micro-organisms in the overall scheme of living things and distinguish them as a natural part of the environment.
- relate microorganism nutrition to type of substrate colonized or parasitized.

Epidemiology

- learn all manifestations of an epidemic in several hosts
- place microorganisms and disease in a clear cause and effect relationship
- distinguish biotic from abiotic diseases

Growth & Development of Microorganisms

- examine and explain typical growth curves and variations of same
- relate elements of growth curve to metabolism with particular emphasis upon nutrition
- couple this (growth) with Ecology and Epidemiology (above)

Metabolism & Microbiol Chemistry

- learn schematic glycolysis and TCA mechanisms and appreciate relevance to electron transport system for all organisms
- become familiar with primary important microorganismic variations on the standard, and relevance of same to disease and decay
- indicate points in cell metabolism where processes may be interrupted by chemicals or physical treatments (Control)

Disease Control

- link final point in unit 7 with practical applications in hospital, factory and other situations.
- consider microbial and host genetics with respect to disease resistance
- relate microbial growth, metabolism and control to epidemiology

Consideration of Specific Animal Disease

- select and study a block of diseases and their causal pathogens which illustrate the greatest variety of cause/effect relationships.

## LABORATORY

Laboratory and theory sections are inter dependent and the point is emphasized and maintained throughout, with the two differing at examinations only in emphasis. On completion, the student shall have appreciation and manipulative skill (where applicable) in:

1. establishment of aseptic conditions
2. preparation of selective & differential media
3. use of media, physical conditions and the organisms native characteristics separate mixtures of microorganisms and establish pure lines
4. use of microscopy, chemical procedure; and biologic keys to recognize and characterize microorganisms.
5. culture of microorganisms from body and laboratory surfaces and from a variety of natural materials.
6. comparison & contrast of a variety of different kinds of microorganisms.
7. application of scientific method as a prerequisite to proper identification understanding of cause and effect.