DEPARTMENT OF BIOLOGY:

**Rationale/Justification** for Reinstatement of the “3+1” Program in Medical Technology as a cooperative program between Francis Marion University and McLeod Regional Medical Center School of Medical Technology

This is a proposal to re-instate a program approved in the past by Francis Marion University, McLeod Regional Medical Center and the South Carolina Commission on Higher Education. In contrast to the previous B.S. degree in Medical Technology, however, this proposal allows the completion of a Biology Degree with emphasis in Medical Technology. The student can finish the 3 + 1 program in four years, rather than the current five years required for the 4 + 1 program. The student would still have the option of obtaining a BS in Biology and then taking the clinical year (4+1).

SCHOOL OF EDUCATION:

**Justification** for changes A & B: To improve quality of our candidates, we are increasing the number of requirements. The written philosophy statement will give us an indication of the applicant’s ability to express his/her thoughts on education in written format. We will use a rubric to score the candidate’s written expression ability and determine if referral to our writing center is needed. The interview requirement will enable us to “get to know” our candidates in a one-on-one setting and develop a course sequence to suit his/her needs (whether part-time of full-time).

**Justification** for change C: The previous M. A. T. program included both undergraduate and graduate requirements, one of which was attaining formal admission to the Professional Education Program. Our current M.A.T. program no longer has an undergraduate component, thus this reference to the undergraduate program should be deleted.
FRANCIS MARION UNIVERSITY: DESCRIPTION OF PROPOSED NEW COURSE or MODIFICATION OF AN EXISTING COURSE

Department/School: Biology Date: 01-18-05

Course No. or level: 496 Title: Medical Technology Internship

Semester hours: 15 + 15 Clock hours:
- Lecture: 8/wk
- Laboratory: 32/wk

Prerequisites: Completion of 3 nine-month academic years of undergraduate studies (or equivalent)
Enrollment expectation: 5/year

Indicate any course for which this course is a(an)
- modification (proposed change in course title, course description, course content or method of instruction)
- substitute (The proposed new course replaces a deleted course as a General Education or program requirement.)
- alternate (The proposed new course can be taken as an alternate to an existing course.)

Name of person preparing course description: Larry Joe McCumber

Department Chairperson’s/Dean’s Signature

Date of Implementation: Fall 2005
Date of School/Department approval: December 7, 2004

Catalog description:

Purpose:
1. For Whom (generally?)
2. What should the course do for the student?

Teaching method planned:

Textbook and/or materials planned (including electronic/multimedia:

Course Content: (Please explain the content of the course in enough detail so that the Academic Affairs Committee can make an informed judgement. Include a syllabus for the course.)

When completed, forward to the Office of Provost.

9/03
Catalog Description

**Biology 495 and 496 Medical Technology Internship:** Internship for a minimum of twelve months under the direction of hospital instructional staff. Course work will include 4 hours Clinical Hematology, 2 hours Clinical Hemostasis, 2 hours Instrumentation and Methods, 4 hours Clinical Chemistry, 4 hours Clinical Microbiology, 3 hours Mycology, Parasitology, Virology, 2 hours Clinical Microscopy, 4 hours Immunohematology, 3 hours Clinical Immunology, 2 hours Medical Laboratory Systems.

Prerequisites: Completion of 3 year academic portion of 3+1 program. Fifteen semester hours per course.

Purpose

1. These courses are for qualified students who have completed the 3 year academic portion of the 3+1 option with the appropriate prerequisite courses.

2. These courses are designed to allow the student to complete the clinical year of the 3+1 program in Medical Technology and become eligible to test for national certification.

Teaching Method Planned

The clinical year internship is a rigorous hands-on learning, doing, teaching experience in the clinical laboratory. One on one transfer of knowledge is routinely utilized in the laboratory. Students also attend 8 hours per week of didactic lecture.

Textbook/Materials

A variety of Clinical Laboratory Manuals and Texts associated with the spectrum of clinical disciplines, outlined in the course content below, are utilized. A large number of procedures and methodologies are taught using a variety of state of the art instruments.

See addendum for a list of textbooks and materials used during the clinical year.
Course Content

McLeod School of Medical Technology
McLeod Regional Medical Center

CURRICULUM OUTLINE

The fifty-one week program integrates classroom lectures and practical experience. Students receive practical experience in each department of the clinical laboratory. Schedules are rotated to give students several weeks to learn the basic techniques of each department. Credit will be given for the following courses:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MT 405 – Clinical Hematology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MT 410 – Clinical Hemostasis</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MT 415 – Instrumentation and Methods</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MT 420 – Clinical Chemistry</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MT 425 – Clinical Microbiology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MT 430 – Mycology, Parasitology, and Virology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MT 440 – Clinical Microscopy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>MT 450 – Immunohematology</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MT 455 – Clinical Immunology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MT 460 – Medical Laboratory Systems</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL** 30

See addendum for description of courses.
<table>
<thead>
<tr>
<th>Author/Editor</th>
<th>Description of Textbook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burtis/Ashwood</td>
<td>Fundamentals of Clinical Chemistry</td>
</tr>
</tbody>
</table>


**Instrumentation in Clinical Laboratory Sections**

<table>
<thead>
<tr>
<th>Hematology/Urina1s</th>
<th>Anatomic Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Advia 120 Hematology Analyzers</td>
<td>2 Sakura Tissue Processors</td>
</tr>
<tr>
<td>2 Stago Compact Coagulation Analyzers</td>
<td>Shandon Cytospin</td>
</tr>
<tr>
<td>1 Atlas Urinalysis Analyzer</td>
<td>Cytyc Thin Prep 2000</td>
</tr>
<tr>
<td>1 Clinitek 200+ Refrigerator</td>
<td>Large Specimen</td>
</tr>
<tr>
<td>3 Centrifuges</td>
<td>Under-Counter Refrigerator</td>
</tr>
<tr>
<td>1 Hematek Slide Stainer</td>
<td>2 Lab-Line Tissue Float</td>
</tr>
<tr>
<td>Baths</td>
<td></td>
</tr>
<tr>
<td>1 Cytocentrifuge</td>
<td>2 Microm Microtomes</td>
</tr>
<tr>
<td>3 Olympus Microscopes</td>
<td>Tissue Tek cryostat</td>
</tr>
<tr>
<td>1 AO Microscope</td>
<td>AO Microscope</td>
</tr>
<tr>
<td>7 Sunquest Computer Terminals</td>
<td>Sartorius Balance</td>
</tr>
<tr>
<td>1 PFA 100</td>
<td>Magnifying Lamp</td>
</tr>
<tr>
<td>Dispenser</td>
<td>Shandon Electric Paraffin</td>
</tr>
<tr>
<td><strong>Immunochrometry</strong></td>
<td>Leica Coverslipper</td>
</tr>
<tr>
<td>Vitros 950</td>
<td>Sakura Automated Stainer</td>
</tr>
<tr>
<td>Freezing Bath</td>
<td>Hettich Centrifuge</td>
</tr>
<tr>
<td>Vitros 250</td>
<td>Shandon Low Temperature</td>
</tr>
<tr>
<td>Center/Cool Plate</td>
<td>Tissue Tek Embedding</td>
</tr>
<tr>
<td>AxSym</td>
<td>3 Dictaphones</td>
</tr>
<tr>
<td>TDx Flx</td>
<td>Microwave oven</td>
</tr>
<tr>
<td>Vitros Eci (2)</td>
<td>Lipshaw Drying Oven</td>
</tr>
<tr>
<td>Blood Gas Analyzers: Gem Premier, IL 1735, IL 1710</td>
<td>Hanson scale</td>
</tr>
<tr>
<td>Fiske Osmometer</td>
<td>Cryostat</td>
</tr>
<tr>
<td>BN100 (Behring Nephelometer)</td>
<td>Autopsy Table</td>
</tr>
<tr>
<td>Quantum II</td>
<td>Autopsy Scale</td>
</tr>
<tr>
<td>Abbott Commander Incubator</td>
<td>3 Helmet and Backpack</td>
</tr>
<tr>
<td>Systems</td>
<td>Overhead Hoist</td>
</tr>
<tr>
<td>IMx</td>
<td>Autopsy saw with vacuum</td>
</tr>
<tr>
<td>Rotina 35 Centrifuge (2)</td>
<td></td>
</tr>
<tr>
<td>EBA 12 Centrifuge</td>
<td></td>
</tr>
</tbody>
</table>
Beckman Electrophoresis System (2)
Helena SURE Spot Electrophoresis System
EDC (Helena Densitometer)

**Testing**

**Blood Bank**

- 4 microscopes
- instrumentation
- 2 cell washers
- Glucose Monitor
- 5 immufuges/centrifuges
- 1 platelet incubator/rotator System
- 1 platelet rotator
- Conductivity Analyzer
- 1 blood storage freezer
- Coagulation Analyzer - TEG
- 2 blood storage refrigerators
- Analyzer
- 6 reagent refrigerators
- Recliner
- 1 biological cabinet/hood
- 1 ice machine
- standing & Wall Mounted)
- 1 Translogic tube station
- 2 MTS centrifuges
- 1 MTS incubator
- 2 waterbaths
- Systems- Point of Care
  - Hemochron ACT
  - Sure Step Pro Bedside
  - Centrifuges
  - Wescor Sweat Collection
  - Wescor Sweat
  - Thrombelastograph
  - Oxicom 02 Saturation
  - Phlebotomy Chairs &
  - Refrigerators
  - Baby Changers (Free
- 4 heat block incubators

**Microbiology Instrumentation**

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzer Computer Module</td>
<td>Vitek</td>
</tr>
<tr>
<td>Analyzer Filler Sealer</td>
<td>Vitek</td>
</tr>
<tr>
<td>Analyzer Incubator Reader</td>
<td>Vitek</td>
</tr>
<tr>
<td>Autoclave</td>
<td>Castle</td>
</tr>
<tr>
<td>Bacti Cinerator Iii (Total: 4)</td>
<td>Kendall</td>
</tr>
<tr>
<td>Bacti Cinerator Ii (Total: 1)</td>
<td>Scientific Products</td>
</tr>
<tr>
<td>Balance Xe - 310</td>
<td>Denver Instrument</td>
</tr>
</tbody>
</table>
Biogard Hood (Total: 2) Baker Co., Inc
Blood Culture Analyzer I, Bactec Becton Dickinson
Blood Culture Analyzer II, Bactec Becton Dickinson
Computer And Printer, Bactec Becton Dickinson
Colorimeter (Total: 3) Vitek
Centrifuge: Dynac II (Total: 2) Clay Adam/Becton Dickinson
Centrifuge: Varifuge 3.0r Baxter (Heraeus)
Finnpipette 50ul Labsystems
Finnpipette 200ul Labsystems
Fluorescent Microscope Leitz
Freezer (Total: 2) Kenmore
Heat Block Lab-Line
Heat Block Baxter
Hood Bioquest
Incubator III (37 Nonco2) Precision Scientific
Incubator I (Room Temp) Precision Scientific
Incubator IV (42 Campy) Precision Scientific
Incubator (Co2) Model 4200 Napco
Incubator (Co2) Model 5200 Napco
Microscope American Optic
Microscope (Double Head) American Optic
Microscope Leitz
Microscope Olympus
Mla Pipette 25ul MLA Systems
Mla Pipette 50,100,200ul MLA Systems
Refrigerator #1 True
Refrigerator #2 Beverage Air
Refrigerator III Kenmore
Refrigerator (Chem Area Total: 2) Beverage Air
Rotator Fisher
Stereoscope Fisher Scientific
Steri-Loop Incinerator (Total: 1) Dade
Computer Terminals (Total: 7)
Label Printer

School of Medical Technology

Compact Desk Top Computer
Kodak Eckagraphic III Slide Projector
Elmo Overhead Projector
Compact Laptop Computer
Emerson TV/VCR
MEDICAL TECHNOLOGY COURSE DESCRIPTIONS

Clinical Hematology MT 405  (4 semester hours)

  Presents an introduction to hematology with a special emphasis on cell identification, including normal and abnormal cells, maturation series of the cell lines and functions of the cells. A concentration on abnormal hematology with special and detailed emphasis on anemias, leukemias, and various hematological disorders occurs after basic concepts are presented. Correlation to the clinical laboratory with regard to instrumentation, histograms and case studies is included. The student is also introduced to the basic techniques and principles of special and routine hematology procedures in the clinical laboratory. Principals of instrumentation, quality assurance, problem solving, correlation of diagnosis with clinical findings, and computer application are emphasized in the clinical laboratory experience.

Hemostasis MT 410  (2 semester hours)

  This course introduces the fundamental principles and concepts of hemostasis. It presents the principles of vascular hemostasis, a detailed study of platelets and their function, the factors involved with hemostasis and the fibrinolytic system, drug monitoring, laboratory testing, thrombolytic states and abnormal hemostasis. The clinical laboratory experience consists of routine and special assays in hemostasis. Principals of instrumentation, quality assurance, problem solving, correlation of diagnosis with clinical findings, and computer application are emphasized in the clinical laboratory experience.

Instrumentation and Methods MT 415  (2 semester hours)

  Fundamental principles the theoretical aspects of laboratory methods and instrumentation. Laboratory mathematics, general laboratory techniques, quality control, reference values, relevance of laboratory procedures, evaluation of laboratory methods, automated analyzers, and automation of laboratory results are discussed. The clinical laboratory experience provides an opportunity to perform chemical analysis using a variety of instrumentation. Quality assurance, correlation of diagnosis with clinical findings, and problem solving are emphasized in the clinical experience.

Clinical Chemistry MT 420  (4 semester hours)

  The theoretical principles of clinical chemical analysis will be introduced. Only those analytes which are most commonly assayed in the chemistry medical laboratory will be covered. Students will perform wet chemical analysis for analytes most commonly assayed in the medical laboratory. Principals of instrumentation, quality assurance, problem solving, correlation of diagnosis with clinical findings, and computer application are emphasized in the clinical laboratory experience.
Microbiology MT 425  (4 semester hours)

A study of the bacterial agents of human infections. Morphology and physiology of bacteria are discussed and related to pathogenesis in the human host. Lecture topics include epidemiology and infection control of bacterial infections, specimen collection and processing, and quality control in the bacteriology laboratory. Techniques will be performed in the isolation, identification, and susceptibility testing of microorganisms commonly encountered in the clinical laboratory.

Parasitology, Mycology, and Virology MT 430  (3 semester hours)

A study of clinically significant parasites, viruses, and fungi. Topics covered include taxonomy, life cycles, morphology, and pathogenicity. Techniques of specimen collection and processing as well as methods used for the identification of parasites, fungi, and viruses are discussed and performed in the clinical laboratory.

Microscopy MT 440  (2 semester hours)

This course involves a detailed study of the chemical and physical characteristics of body fluids. Cellular elements are studied. Characteristics of body fluids are correlated to normal and disease states. The laboratory experience includes routine urinalysis and various miscellaneous assays. Principals of instrumentation, quality assurance, problem solving, correlation of diagnosis with clinical findings, and computer application are emphasized in the clinical laboratory experience.

Immunohematology MT 450  (4 semester hours)

The theory and practice of standard procedures involved in collection, processing and pretransfusion testing of blood components will be presented. The principles and methods needed for clinical application will be emphasized. Practical experience in the Blood Bank is correlated with fundamental immunohematology theory. Problem solving, quality assurance, and correlation of diagnosis with clinical findings is emphasized in the clinical experience.

Immunology MT 455  (3 semester hours)

This course encompasses the human immune system including cells and related tissues. Principles of antigen/antibody reaction are stressed and applied in a clinical laboratory setting. Diagnostic tests used to establish a patient's immune status or deficiency are discussed. The course material and laboratory skills taught in Immunology will allow the student to understand the diagnosis of immune disorders. Principals of instrumentation, quality assurance, problem solving, and computer
application are emphasized in the clinical laboratory experience.

**Medical Laboratory Systems MT 460 (2 semester hours)**

This course includes an introduction into the clinical laboratory, education methodologies, principles of management, and principles of phlebotomy and specimen handling. Introduction into the laboratory covers medical terminology, safety and government regulations, policies of the school, laboratory and hospital, infection control, introduction to the computer system and quality assurance. Principles of ethics, communication and team building as well as educational methodologies are covered topics in MT 460. The management portion of MT 460 considers the basic principles of supervision, personnel relations, financial management and the general operation of a clinical laboratory as well as research design and practice used to evaluate published studies. Laboratory operations topics will include clinical decision making and critical pathways, performance improvement, performance evaluation, utilization of personnel and staffing patterns. The phlebotomy portion of MT 460 consists of an introduction into phlebotomy and sample handling and collection. Clinical laboratory experience includes routine venipunctures, skin punctures, bleeding times, and computer applications.