



University of  
**West Florida**

**PROGRAM REVIEW  
EXECUTIVE SUMMARY  
2006 - 2007**

**Department of Biology  
Clinical Laboratory Sciences Program  
College of Arts and Sciences**

**51.1005 Clinical Laboratory Sciences, B.S.**

*Vice Provost for Academic Programs and Planning  
The University of West Florida  
11000 University Parkway  
Pensacola, Florida 32514  
Telephone: (850) 474-2035      Fax: (850) 474-3131  
E-mail: [blyman@uwf.edu](mailto:blyman@uwf.edu)*

# Clinical Laboratory Sciences Program Review

## Executive Summary

2006-2007

### Table of Contents

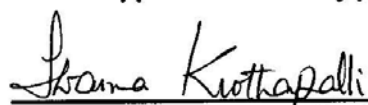
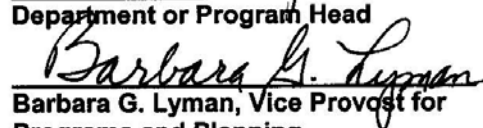
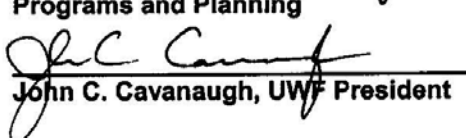
Confirmation of Processes for Academic Program Review	3
Executive Summary	
▪ Program reviewed	4
▪ Brief description and nature of re-accreditation review	4
▪ Directory information on external consultants	5
▪ Synopsis of prior actions	6
▪ Academic learning compact	16
▪ Strengths/Weaknesses/Opportunities/Threats	18
▪ Recommendations from current review	22

**CONFIRMATION OF PROCESSES  
FOR  
ACADEMIC PROGRAM REVIEW**

I hereby confirm that the enclosed program review for Clinical Laboratory Sciences Program has included all processes outlined in Board of Governors requirements:

- a delineation of the specific academic programs (with levels) that were included in review
- a brief description of the nature of the review and whether it was part of an accreditation review or self-study with external consultant
- directory information on the external consultant
- a synopsis of actions taken as a result of earlier program reviews
- a copy of the Academic Learning Compact for each reviewed baccalaureate degree program
- a summary of program strengths, weaknesses, opportunities, and threats (SWOTs)
- recommendations based on review findings.

These items are included in the Executive Summary. Further, each program review was conducted according to University of West Florida approved university policy.

 Department or Program Head	<u>5-30-2007</u> Date
 Barbara G. Lyman, Vice Provost for Programs and Planning	<u>6-5-07</u> Date
 John C. Cavanaugh, UWF President	<u>6/25/07</u> Date

## Executive Summary

### **A. Specific Academic Program in Review**

51.1005 Bachelor's in Clinical Laboratory Sciences Program (formerly Medical Technology Program)

### **B. A Brief Description of the Nature of the Review**

In 2006-2007 the UWF-CLS Program is scheduled for a concurrent review process by two entities.

1. Program Review for renewal of accreditation by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). NAACLS Program Review is done in 7 year Cycles. The UWF-CLS Program was reviewed by NAACLS in AY 1999-2000 and was awarded accreditation for 7 years.

NAACLS Accreditation Process includes:

- a) Submission of an extensive Self-Study Report according to NAACLS guidelines – October 27, 2006
  - b) Paper review of the Self-Study Report by a peer reviewer recruited by NAACLS, followed by the Program's response to reviewer's comments. November –December 2006
  - c) A two day site-visit by 2 external reviewers (volunteers from other CLS Programs in the nation selected by NAACLS and approved by the Program in review) - February 27-28, 2007
  - d) Site-visit report by the external reviewers submitted to NAACLS, followed by the Program's response to site visitors' comments- March-April 2007
  - e) Review and recommendation by CLS Program Review Committee of NAACLS- July 2007
  - f) Final action and notification by the NAACLS Board of Directors – October 2007
2. UWF Academic Programs Review

As part of the UWF's participation in Seven-Year Academic Program Review Process the CLS Program was scheduled for a review in conjunction with the accreditation review in 2006-2007.

At the beginning of the current cycle of review process (April 2006) it was agreed by UWF administration and the CLS Program officials that the NAACLS Self-Study and the Site-Visit by external reviewers will be accepted as an integral part of the UWF Academic Program Review, thus eliminating the need for an additional external reviewer.

It was decided that according to the guidelines two internal reviewers, one from within the College of Arts & Sciences; and the other from one of the other Colleges at UWF will be selected to join the NAACLS team in the reviewing process.

### **C. Directory Information on the Consultants**

#### **External Consultants**

Team Coordinator: Carol T. McCoy, PhD, MT (ASCP), CLS (NCA)  
Program Director  
Fairview Health Services CLS Program  
Laboratory Services  
2450 Riverside Avenue, W1-505  
Minneapolis, MN 55454-  
Phone: (612) 672-4298, Fax: (612) 672-4280  
Email: cmccoy1@fairview.org

Team Member: Sheryl Whitlock, MA, MT (ASCP)  
Laboratory Coordinator  
University of Delaware, Student Health Services  
Laurel Hall, 282 The Green  
Newark, DE 19716  
Phone: (302) 831-8322, Fax: (302) 831-6407  
Email: [whitlock@udel.edu](mailto:whitlock@udel.edu)

#### **Internal Consultants**

Richard Doelker, Ed.D  
Professor  
Division of Social Work  
College of Professional Studies  
University of West Florida  
Bldg 85, Room 137 Pensacola, FL 32514  
850-474-3357  
rdoelker@uwf.edu

Rohan Hemasinha, Ph.D  
Professor  
Department of Mathematics & Statistics  
College of Arts & Sciences  
University of West Florida  
Bldg 38, Room 127  
850-474-3276  
rhemasin@uwf.edu

## D. A synopsis of actions taken as a result of the earlier reviews

### **Actions taken as a result of NAACLS Review 1993 and BOR Review 1996**

During the decade of 1990-2000 the CLS Program (then Medical Technology Program) at The University of West Florida has been evaluated by NAACLS; by Board of Regents of the State University System of Florida; by students, graduates and employers. Through each cycle of evaluation the Program was recognized for its quality and emerged as a strong academic unit with an excellent curriculum and coordination of student services. As a result of these sustained positive outcomes in evaluations, the program's physical, personnel, financial, instructional and computer technology resources have been significantly enhanced, especially during the second half of the decade. There have also been several major and minor changes made in curriculum and other elements of the program as a result of the program evaluation. Highlights of these improvements are as follows:

#### **Enhancement of Program Resources**

**The need for a dedicated student laboratory** was recognized by NAACLS reviewers as well as BOR consultants. Student evaluations frequently mentioned the need for more practice time in student laboratory work, which was not possible when the laboratory space was shared with biology and chemistry courses. The faculty were at a disadvantage due to the lack of a designated space for laboratory class preparation. They had to set up the equipment before and clear the equipment after each class period, costing much effort and loss of precious time. Now the Program has an excellent dedicated laboratory complex, which is available for clinical laboratory sciences students and faculty around the clock. The proximity of faculty offices and program office to this teaching facility enhances communication with and monitoring of the students on a daily/hourly basis. The laboratory is furnished with the latest in instructional technology devices and is also used as the classroom for lecture periods.

**The need for incorporation of computer technology** into the curriculum was recognized early in this decade. After an initial slow beginning by the University in computerizing faculty offices, and updating the instructional technology; significant advances were made in the later part of the 1990s. Adjacent to the teaching laboratory, a student computer lab was established. Large volumes of computer based instruction materials were purchased and installed in the computers. Computer based assignments are incorporated into the curriculum.

**The need for additional personnel resources** was recognized and recommended by each visiting team of evaluators. As the number of clinical sites increased, the need for more frequent communication and coordination with the students and clinical faculty at the hospitals necessitated the hiring of a half- time Clinical Site Coordinator who is essentially in charge of all aspects of students' clinical rotations, reporting to the program director. It is a great improvement over the past when only two faculty members struggled to teach, advise, administer and also coordinate the clinical sites. A full time Laboratory Manager/Instructor position was given to the program; when it became clear that the on-campus student clinical laboratories have special safety and subject matter expertise requirements which could not be fulfilled by rotating

biology graduate teaching assistants, a new one each semester. Now the program has a dedicated faculty member who is fully in charge of all aspects of laboratory instruction and maintenance of equipment. After many years of program operation with part time/temporary secretaries, the need for continuity and stability in Clinical Laboratory Sciences Program Office management was acknowledged by the administration. As a result, a full-time regular employee was hired as the Office Administrator to manage and coordinate the numerous tasks emanating from an accredited allied health program with 8 clinical sites and with several external agencies such as NAACLS, ASCP, NCA, State of Florida, Community Colleges and High Schools to deal with on a regular basis.

### **Modifications in Curriculum:**

During 1993-2000 several major and minor changes have been made in curriculum and other elements of the Program. To cite few examples:

A couple of years ago, through student comments and their performance in the examinations, a deficiency of knowledge in the preparation and storage of blood components surfaced. As a result the one day rotation to Northwest Florida Blood Center was redesigned to include specific guidelines for observation and study questions to ensure that all areas of component preparation and donor services were covered. Currently students express satisfaction with the blood bank rotation.

Prior to 1996, students were given an assignment during the 7 month period of their clinical rotations to prepare and submit a 200-multiple choice question test with an equal distribution of questions in the five major areas: Hematology/Coagulation; Clinical Chemistry; Clinical Microbiology, Immunohematology/Serology and general principle of laboratory practice. In 1996-97 this assignment was discontinued and replaced with Journal Club presentations. Each student, according to a previously fixed schedule, reads and gives an oral presentation of a recent journal article on a topic of current interest in the field. During their clinical rotations, each student is required to give five presentations, one each in Clinical Chemistry, Clinical Microbiology, Hematology/Coagulation, Immunohematology and Management. Credit is given in the form of added points in the related clinical courses. Students seem to enjoy and benefit from this assignment and we plan to continue and even enhance this assignment in other ways in the future. Test construction has now been incorporated into the on campus course titled Special Clinical Topics.

Also during academic years 1994-96 deficiencies in the instruction of courses in Clinical Chemistry and Diagnostic Microbiology developed due to a new faculty hiring. Students commented frequently on the lack of instruction in endocrinology and toxicology; lack of correlation between objectives, assignments, instruction and evaluation in these areas. As a result the faculty member was replaced.

Another significant change, made as a result of comments and recommendations made by the education coordinators is the deletion of stand alone comprehensive exams at the end of each rotation. In the past, students were given not only an exam at end of each week in a clinical rotation, but also a 100-multiple choice comprehensive exam on Monday morning of the first day of the next rotation. It was frequently brought to the attention of University faculty that the

student is losing a significant portion of the practical experience, especially in a one week rotations such as Coagulation and Urinalysis. The comprehensive exams were modified and incorporated as a 50% component of the final weekly exam in a given major clinical rotation.

During 1994-96 the course sequence and instruction in Clinical Microbiology was significantly modified. Based on the comments by students and recommendations made by the education coordinators and faculty, the instruction in this area was improved by the following changes: A new course titled Medical Microbiology (MLS 4462 / 4462L) was added to the clinical course menu and two of the biology prerequisites >Applied Microbiology= and >Parasitology= were dropped as requirements for the clinical laboratory science students.

The course in Parasitology was designed and taught for biology majors with only a brief coverage of clinically important organisms and none of the lab procedures in Clinical Parasitology. The course Applied Microbiology covered public health microbiology, with a duplication of techniques taught in MLS 4460 Diagnostic Microbiology I. Prior to this change the syllabus of the on-campus course MLS 4460 Diagnostic Microbiology I included not only aerobic and anaerobic clinical bacteriology, but also topics in Mycobacteriology, Mycology and Clinical Virology. The course had too much material to be covered and topics in TB, Mycology and Virology received only minimal coverage.

After this change, the course Diagnostic Microbiology-I is entirely devoted to aerobic and anaerobic clinical bacteriology and the new course Medical Microbiology covers topics in Clinical Parasitology, Mycobacteriology, Mycology and Virology. The current course sequence, beginning with the General Microbiology, followed by Diagnostic Microbiology-I, followed by Medical Microbiology, followed by hospital based course Diagnostic Microbiology II provides a strong foundation for the entry level clinical laboratory scientist in diagnostic microbiology.

By these measures MLS 4460 Diagnostic Microbiology is strengthened, the program gained control over the curriculum in Clinical Parasitology, the duplication of material and extra credit hours due to Applied Microbiology were deleted, and the topics in TB, Mycology and Virology have now an expanded coverage in the university based curriculum.

### **Actions taken as a result of 1999-2000 – St of FL SUS System Academic Programs Review**

In 1999-2000 the CLS Program (then Medical Technology Program) was one of the six programs selected for a program review as part of the pilot process for the State University System's (SUS) new program review methodology. Following an internal self assessment / review process, which was based on the required measures of the 1999 Senate Implementing Bill, as well as those measures set by the University and the National Accrediting Agency for Clinical Laboratory Sciences, a final report was submitted by the University at the end of the academic year 1999-2000.

In February 2001, the University received a Five-Year Program Review Report for the Medical Technology Program from the Board of Regents-Office of Academic and Student Affairs.

Following is a synopsis of the actions taken as a result of this Program Review:

- 1. Develop new strategies to enhance the visibility of the program to prospective students at high schools / community colleges and to increase enrollment**

Program Faculty developed a new 8" x 17" poster, which was mailed to guidance counselors and academic advisors at all high schools and Community Colleges in Northwest Florida, South Alabama and Georgia. The Program's WEB Site is revised and improved.

Faculty provided workshops in Clinical Laboratory Sciences to high school students, visited high schools and community colleges on a regular basis, and participated in several recruitment activities to promote the Program to prospective students.

During 2005-2006 the Program was promoted through mass mailing of information to directors of human resources at health care facilities, community colleges and other potential sources of prospective students.

In 2005, through a request for one-time funding proposal from Provost Flake, the Program was awarded funds to develop a new program brochure and to revise/reprint the Student Handbook. In 2006 these publications were completed and put in use for recruitment / advisement related activities.

The Medical Technology Student Association was reactivated. The current MTSA is active in promoting the UWF program through participation in UWF and Community Service Activities. (<http://uwf.edu/medtechclub> )

**2. Maintain affiliation with each of the current five clinical sites and explore the possibility for obtaining new sites to meet the demands of increases in enrollment**

Since 2000, enrollment was on the rise. By 2004 the Program had 100 + majors in all 4 years of the Program. The number of students reaching the clinical year increased from an average of 12 to an average of 15 students.

In 2005, three additional clinical sites were added to the Program and affiliation agreements with all of the other five clinical affiliates were renewed. For the first time in the history of the Program, in January 2006, UWF's Clinical Laboratory Sciences Program placed students for clinical rotations at: Shands (Hospital) at University of Florida, Gainesville; Shands at AGH, Gainesville; and Shands Jacksonville.

UWF's partnership with all of the eight clinical affiliate hospitals is maintained well. The Program receives excellent support from its clinical affiliates, which is a great asset in providing a state-of-the-art training to our students.

**3. Coordinate class schedules with Biology and Chemistry department chairs to prevent class time conflicts for medical technology students taking the prerequisites**

Problems in this area still arise frequently. However they are minimized through a close articulation with Biology and Chemistry departments during class scheduling time each semester. Current chairpersons of Biology and Chemistry departments are very supportive of the CLS program and are very helpful in resolving class schedule conflicts.

**4. Strive to reduce the student drop out rates in prerequisite chemistry courses.**

Both Biology and Chemistry Departments instituted tutorial assistance programs. Students also receive assistance in this area through the University's Student Success Learning Center. However, student dropout due to problems in Chemistry and/or Biology prerequisites is a significant problem for Clinical Laboratory Sciences Program. Improvement in the quality of entry level student is a possible answer, but until the enrollment is so high as to make it truly competitive to enter into the clinical year we have to strive for student success through indirect measures such as academic advisement and tutorial assistance. Academically average students seem to have the greatest difficulty in passing chemistry and upper level biology prerequisites. This problem should be addressed by the respective departments and instructional methods should be improved to enable the average students to successfully complete the course requirements.

**5. Set a goal and take steps towards establishing a "College of Health Professions" at UWF by 2005**

Since this recommendation was made by the Medical Technology Program faculty in 2000, UWF has established a Division of Life and Health Sciences in the College of Arts & Sciences. Dr. George Stewart, who was hired as the Chair of Dept of Biology in Aug 2000 was appointed as the Director of DLHS. In 2006 the Division was elevated to the status of School of Allied Health and life Sciences (SAHLS). At present, Dr. Stewart is actively engaged in developing new health related programs at UWF, including a Masters in Public Health, which is now offered on line.

**6. Develop a BS degree in Health Sciences to provide career enhancement opportunities to practicing associate degree level allied health professionals.**

In 2002-2003 Medical Technology Program Director submitted a draft for a BS degree in Health Sciences to the Director of the Division of Life and Health Sciences. It was adopted and currently the B.S degree in Health Sciences is being offered by the SAHLS.

**7. Increase the Program's faculty resources to boost the faculty involvement in hospital based clinical courses**

Currently we have a part time visiting faculty to coordinate and monitor students' progress in hospital clinical rotations. It would be highly beneficial to the Program if this position is enhanced to a regular full- time faculty, who is in charge of curriculum in clinical rotations as well as university based instruction in Diagnostic Microbiology.

In 2005-2006 the Program submitted a request for a new full time faculty member, to begin in Jan 2006. As NAACLS re-accreditation effort and the UWF Academic Program Review were imminent (2006-2007), it became apparent that we needed an additional faculty member to relieve the Program Director of some teaching load, and to meet other programmatic needs such as a regular faculty member for Medical Microbiology (which is now being taught by an adjunct).

This request was not granted. OPS funds were offered to hire part time help, but no qualified people were available locally to hire on a temporary basis. The Program Director, while teaching full time, serving as full time advisor, and full time administrator, had to prepare the self study for NAACLS reaccreditation and program review by UWF in 2006-2007. This is a major weakness of the Program.

#### **8. UWF to seek and cultivate contacts among major biomedical and pharmaceutical companies to raise funds for the health profession programs at UWF**

Though a worthy goal, fund raising is beyond the scope of program faculty's time and ability. Recently the University Administration proposed to undertake this task and asked the Program Faculty to provide information regarding interested parties and potential donors. We are collecting this information.

#### **Actions Taken as a result of and since NAACLS Review 1999-2000**

During 2000-2006 s, based on the continuous and systematic program evaluation, few major and several minor changes have been made in curriculum and other elements of the Program. Following are a few examples:

##### **ASCP-BOR Scores: Adjustments made in courses to beef up the content**

The composite and individual scores of the registry reflect the strengths and weaknesses of the individual students, the course materials, and the faculty. An example of how we use the ASCP data is given here: In the area of Diagnostic Microbiology, even though overall scores were above national average, students showed a decrease in one component during the 2005 cycle. At the same time, students complained about the vagueness of some of the chapters of the textbook, even though it was the latest edition of that text. In 2006 a new textbook was put into use, and the university and hospital examinations were updated. Such adjustments are made in other areas as well, in which weakness is seen in students' scores in the external examinations. Students are surveyed at the completion of their clinical rotation in Microbiology (and all departments), and questioned as to whether or not they felt prepared for their hospital rotation. These indirect assessments are taken into account in revisions of the class for the following year.

Medical Microbiology has been taught by the same adjunct faculty member for many years. From 2005 on, she was not available to teach. We hired two other adjunct instructors to fill the years. We have requested a third faculty line to be the primary instructor for Clinical Microbiology and this request is under consideration by the administration. We believe that the addition of a third regular faculty line will allow an equitable distribution of teaching load, give some relief to the next program director, and provide time for faculty research and creative activities in the future. A single faculty member in charge of all three MLS courses in Clinical Microbiology (Diagnostic Microbiology-I and Medical Microbiology on campus; and Diagnostic Microbiology II – 7 weeks of clinical rotation at the hospital) will enhance the quality and consistency in delivery of the curriculum in this area.

**E-learning:** During the past 5 years a significant change has been made in instruction and evaluation of campus based MLS courses. All of these courses are converted into e-learning format, which is supported by the ITS (Information Technology Services) and ATC (Academic Technology Center) of the University. Instruction and evaluation is now conducted in a blended format. (classroom presentations blended with computer based and on-line instructional technology). Every lecture in every course is in power point format, available to the students on-line through e-learning. Course syllabi, course policies, expected student learning outcomes, study questions, case studies, home work exercises are all available to the students, as

determined by the instructor, at home or in classroom. This conversion of courses into a blended technology format constitutes an enormous amount of time and work on part of the faculty during the recent 3-4 years. Current students have a distinct advantage in having the course materials so readily available to them in and out of the classroom, which undoubtedly facilitates learning and retention of the subject matter.

**Computer at each student's work station:** In order to facilitate instruction/evaluation in a blended computer technology format, computers were placed in the classroom/lab in 2002. Since there were only 10 computers students had to share the computers in class work.

**In spring 2006 the old computers were replaced with 20 new Gateway computers.** So the classroom is now equipped with a computer with internet connectivity at each student work station. The computer based work is integrated into lecture and lab sessions in all of the courses.

**Laboratory Instruments and Equipment Purchases:** As a result of our continuous assessment of the student laboratory needs several pieces of major and minor equipment/instrumentation were added in recent years. To improve training in clinical chemistry labs the old spectrophotometers were replaced with 10 brand-new Pointe 180 Spectrophotometers, which are designed for student lab instruction. We acquired a major chemistry analyzer (Dade Dimension) through donation from a hospital. A new hematology blood cell counter was purchased. New instruments and equipment were purchased for student training in molecular diagnostic methods. Currently the Dean has allocated approximately \$30,000, over the next 3 years, to maintain/upgrade the laboratory instruments or equipment used in student labs. Through our own assessment as well as from the input received from students and graduates, the technology needs of our student laboratory complex are recognized and presented to the administration on a continuing basis. Overall, the student laboratory complex is relatively well equipped and functional in meeting the meeting the student training needs.

### **Phlebotomy Training**

In the survey returns from exiting graduates, recent graduates and their employers, a frequently made comment pertains to deficiencies in students' phlebotomy skills. Faculty is aware of this need for improvement in this area and will continue to make efforts to improve training in this area. However, since we have no direct access to patient population, the phlebotomy training in campus courses is somewhat limited in scope. Even so, the students are given adequate training to collect a blood specimen from a normal healthy subject by the time they complete the campus based course work.

It appears that the students receive variable levels of phlebotomy training at different clinical sites, based on the individual lab's practices and time frames in blood collection. Beginning with clinical rotations in 2007, the faculty plans to make a special effort to standardize phlebotomy training at various institutions, by discussing this matter with the education coordinators at the hospitals and taking necessary steps to evaluate the students' skills in specimen collection by the time of their graduation.

### **Lab Management/Communications/Laws and Regulations:**

Based on the input received from members of the advisory committee, as well as to add all the curriculum elements required by the latest NAACLS Standards the following areas are strengthened in the course MLS 4705 Special Clinical Topics and in other courses across the curriculum:

- Laboratory operations to include financial and human resource management

- Dynamics of health care delivery systems as they affect lab services
- Laws and Rules pertaining to laboratory accreditation, license and compliance
- Education methods and terminology to train/educate trainees, new employees and users of lab services
- Interpersonal and interdisciplinary communications
- Ethics and Professionalism and prevention of medical errors

**Continuing Education:** Documentation of continuing education is required for renewal of license by State of Florida and for maintaining certification by ASCP-Board of Registry. So our students are taught the importance of keeping their technical knowledge and skills up to date by attending CE programs. The CLS Program at UWF offers an annual seminar (A day of Continuing Education in Clinical Laboratory Sciences) and also contributes to the annual convention of CE Programs offered by the local Northwest Florida Laboratory Association.

### **Development and implementation of a new course in Molecular Diagnostics**

In 2001, following the trends in the professional practice, and also according to the input received from members of the advisory committee and other sources in the field, the Program began incorporating molecular diagnostic methods into the curriculum. During the next 4 years molecular diagnostics was included in various clinical courses. Several instruments (thermocycler, electrophoresis equipment, digital densitometer) were purchased and basic concepts of molecular diagnostics were incorporated into the courses in Clinical Chemistry and Diagnostic Microbiology.

Through the continued assessment of the curriculum needs (surveys of practicing professionals and Advisory Committee members) the faculty decided to carve out a new course dedicated to the teaching of molecular diagnostics out of the existing sequence of two clinical chemistry courses ( BS degree in CLS, in State of Florida, is capped at 127 semester hours. State Law prohibits addition of new credit hours to an approved degree).

<b>Previous</b>	<b>SH</b>	<b>New- Effective Summer 2006</b>	<b>SH</b>
MLS 4625 & 4625L Clin Chemistry I-	4	MLS 4625 & 4625L Clin Chemistry I-	3
MLS 4630 & 4630L Clin Chemistry I -	<u>4</u>	MLS 4630 & 4630L Clin Chemistry II-	3
	8	MLS 4191&4191L Mole Diagnostics -	<u>2</u>
			8

In 2005 Curriculum Change Requests were submitted and the changes were approved by the University. Beginning Fall 2006 Molecular Diagnostics is taught as a separate course.

The data from surveys previously mentioned also revealed a need for, and an interest in, a Certificate Program in Molecular Diagnostics. A proposal was submitted to the administration and the development of this program is a possibility in the future. Our request for third (regular, full time) faculty line was also linked to this proposal. So the addition of a third faculty line will facilitate improvement in the existing teaching load/expertise areas of the curriculum, as well as make it possible to offer a certificate program in molecular diagnostics. We offer this as one of the major goals for enhancement of the Program in coming years.

## Evaluation and Modification for Student Seminars

**Student Capstone Seminar:** Students are required to give a medical seminar during their clinical rotation. We have chosen this seminar as the capstone event for assessing 2 of the domains of the Academic Learning Compact: Critical Thinking and Project Management. Initially, the faculty met and discussed methods to improve the quality of the student seminars, which ranged from exceptional through good to an occasional seminar which is generic and failed to focus on Clinical Laboratory Sciences.

Dr. Behan devised a general rubric to classify the quality of the talks, and observed and scored 8 student seminars in 2005. (Scores and rubrics described in this summary can be found in a narrative in Standard 19). She determined that five out of eight could be improved by better training. She created a table of problems that were observed, along with suggestions to obviate the problems. Some of the problems, for example nonprofessional appearance, were easily addressed by creating an instructional rubric for the students with precise instructions.

Critical Thinking and Project Management skills of the students were analyzed using an embedded assessment that rated the ability of each individual student to correlate results from various procedures to the management of the patient's condition, and to discuss tables and figures in appropriate depth to an audience of their peers. Using these rubrics, it was apparent that some students did not fully grasp the full meaning of topics they were presenting. In order to improve students' ability to read and report research and interpret patient results, students are currently steadily introduced to communication and dissemination tactics through a series of assignments:

In Clinical Chemistry I, students are required to write 2 short case studies, which are evaluated with published rubrics. Students peer review each others' work prior to submission, which is a technique that improves their own work and another student's. This can be a big eye-opener for an average student. Following peer review, the student is allowed to rewrite for a higher grade.

In Clinical Chemistry II, students give a presentation on a journal article that is relevant to the class. They are coached in PowerPoint, and project management. This project has multiple deadlines, selecting a topic, writing an outline, doing a peer reviewed practice talk and then the final talk. The concept of self-enforced deadlines is reinforced here. Furthermore, the same grading rubric that will be used for their hospital seminar is applied, but in a "safer" zone, as they are able to readily meet with the instructor beforehand to iron out details. Students give a practice talk in front of a small group of peers, which is not graded, but allows for comments and improvement. For example, a peer may say "I don't understand that concept; can you put it in a different context for me." Finally, the students give the presentation to the entire class.

During clinical rotations, Dr. Smith meets with students monthly and they have to present a journal article "Journal Club" to him, and discuss its impact. With respect to the capstone seminar, students are given a list of acceptable topics, and they can opt for another topic if it is approved. In summer 2006, the first cycle of students who had gone through this improved training also showed an improved product. Nine out of 15 students gave exceptional coverage of their topics. One student was invited to co-author an article based on her research. Students were invited to evaluate themselves in the domains of Critical Thinking and Project Management, and their evaluations were compared with Dr. Behan's evaluation:

Behan: 100% of students achieved a satisfactory to excellent rank in the ability to correlate results from various procedures with management of a patient's condition;

92% of the students agreed that they were able to correlate those results.

Behan: 93% of the students were able to research new laboratory procedures and evaluate their effectiveness; 67% of the students agreed that they were able to do so.

92% of the students felt that they had received good training during Clinical Chemistry and Journal Club presentations, and 77% of them felt that the rubric aided them in the preparation of the talk.

Current status of this project: reinforcement of progression in skills for the current students, with continuing monitoring and assessment, and improvement on finer details.

As may be seen in the detailed description of the QEP on Student Seminars (included in Standard 19 of NAACLS Self-Study) there is a significant improvement in communication/project management skills of the students.

## E. A copy of the Academic Learning Compact



### CLINICAL LABORATORY SCIENCES

#### Mission Statement

The Clinical Laboratory Sciences Program offers a baccalaureate degree of highest quality in clinical laboratory sciences, enabling the graduates to develop successful careers in bio-medical technology fields and to pursue advanced degrees in related fields. The faculty of the program strive to advance the knowledge, technology, and education methods in clinical laboratory sciences; to maintain clinical affiliations with local and regional health care facilities and serve as a source of well qualified personnel to staff their clinical laboratories; and to promote and enhance the public's knowledge regarding the profession of clinical laboratory sciences and the UWF's Program.

#### Student Learning Outcomes

Clinical Laboratory Sciences Program graduates should be able to do the following:

#### Content

- Recognize and apply concepts, principles, and theories from the sciences that underlie clinical lab skills (e.g., biochemistry, pathophysiology)
- Apply methodological principles from clinical courses
- Recognize and apply principles of quality assurance
- Use medical technology terminology accurately
- Describe career opportunities available in clinical laboratory science, including opportunities in independent practice
- Articulate frontiers of knowledge in chosen profession

#### Critical Thinking

- Distinguish abnormal from normal results
- Interpret and evaluate clinical procedures and results
- Make and confirm sound diagnostic conclusions
- Predict clinical course following diagnosis
- Conduct research using appropriate literature
- Select and apply appropriate statistical procedures to evaluate data

#### Communication

- Select, operate, and maintain appropriate strategies for recording/reporting results
- Communicate effectively with related medical professionals and service providers
- Interact effectively with patients using calm and reasoned judgment and sensitivity to patient characteristics.
- Make professional oral presentations of findings

#### Integrity/Values

- Articulate appropriate professional responsibility for patient's welfare

- Recognize and adhere to applicable professional regulations, ethical standards, and program’s code of conduct
- Advocate for effective, timely, accurate, and cost effective service to demonstrate commitment to patient’s welfare
- Maintain confidentiality of patient information

### **Project Management**

- Correlate results from various procedures with management of patient’s condition
- Research, develop, and perform new laboratory procedures and evaluate effectiveness
- Enact principles of best practice for lab management
- Enact principles of best practice for human resource management

### **Hazard and Risk Management**

- Recognize and describe principles and regulations regarding lab safety
- Practice lab safety procedures and protocols
- Identify and prevent medical error or minimize consequences of medical error

### **Evaluation of Student Learning Outcomes**

The Clinical Laboratory Sciences program uses the following measures to assess the student learning outcome achievements of our graduates and for on-going continuous program improvements. A. Direct measures: Mid Term Comprehensive exam to test the student learning in content areas of clinical laboratory sciences; Practical exams and unknown specimen evaluations; Seminar presentations; Journal Club Presentations; Final Comprehensive Examinations and external (National) Board Certification Exams. B. Indirect Measures: Exit survey completed by graduates; Survey of recent graduates; Employer Survey and Evaluation by an Advisory Committee.

### **Job Prospects for Clinical Laboratory Sciences Graduates**

<b><u>Clinical Lab Scientist in:</u></b>	Section Supervisor/Specialist	Clinical Laboratory Manager
Clinical Chemistry	Public Health Lab Scientist	Lab Education Coordinator
Hematology/Hemostasis	Crime Laboratory Scientist	Blood Bank Administrator
Diagnostic Microbiology	Lab Technical Supervisor	Lab Services Marketing Sp
Immunohematology	Biotech Industry-Sales Rep	Quality Assurance Officer
Clinical Immunology	Biotech Industry-Training Rep	Lab Information Specialist
Molecular Diagnostics	CLS Program Faculty	Clinical Lab Consultant
Toxicology	Pharmaceutical Lab Scientist	Regulatory Compliance Officer

***Find Out More about Clinical Laboratory Sciences Program at UWF:***  
*[uwf.edu.clicallabsciences](http://uwf.edu.clicallabsciences)*

## **F. A Summary of Program's strengths, weaknesses, opportunities and threats**

### **1999-2000 Academic Programs Review –Summary of Consultant's Report**

The most recent Clinical Laboratory Sciences (Medical Technology) Program Review was conducted in conjunction with the NAACLS re-accreditation review in 1999-2000. The BOR review report (2001) reflected a thorough understanding and a positive acknowledgment of the of the Program's history, mission, goals & objectives, procedures used to assess program's effectiveness and the Program's response to prior reviews and recommendations.

The report included a brief summary of the reviewer's findings in each of these areas. It was acknowledged that in accomplishing its major mission of teaching and training clinical laboratory professionals the program embraced as its core values: instilling in students a sense of professional integrity, value of service to the community and promotion of diversity and equal opportunity in work place.

The report accurately reflected the curriculum requirements, limited access status, criteria for selection into the clinical year, role and scope of the Advisory Committee and the evaluation mechanisms used to measure the effectiveness of the Program.

The report provided an analysis of how well goals and objectives were achieved within the Context of the mission. In this section the review report acknowledged the following:

- The Program is successful in maintaining national accreditation and state license
- The NAACLS review report in 1993 stated that the Program was well organized, well run, and produced well qualified graduates. It has a strong curriculum, strong student advisement systems, outstanding clinical affiliates, committed faculty and good support from UWF administration
- Consistently high rate of student success in the external examinations. The scores achieved by UWF graduates in Board certification exams are well above the national means.
- The graduate and employer surveys reveal a high level of satisfaction with the education received and the quality of employee preparation respectively
- The rate of completion of degree is 2 years for a community college transfer who has taken the chemistry prerequisites, and 3 years for a transfer student without chemistry

There was a higher rate of changing major or dropping out in FTIC students who declared a major in Medical Technology. This situation has improved in the recent 2-3 years. Our share of FTIC students who are entering and graduating from Clinical Laboratory Sciences is slowly increasing. Increased awareness of job vacancies and rising salaries may be the reason for this improvement. We have also increased our monitoring and advisement sessions to these students.

- Subsequent to and as a result of recommendations made by the 1993 (NAACLS) and BOR (1996) reviews, the Program received substantial and much needed increases in resources during 1995-1999 period

Overall, the 1999-2000 Program Review Report reaffirmed the strength and quality of the UWF Medical Technology Program

### **Summary of program's strengths reported by the Program Review Team**

Through each cycle of evaluation the UWF Medical Technology Program was recognized for its quality and emerged as a strong academic unit with an excellent curriculum and coordination of

student services.

Since the Program Review by NAACLS in 1993 and by BOR in 1996, the Program's physical, personnel, financial, instructional and computer technology resources were significantly enhanced:

- The Program now has a dedicated student laboratory complex, equipped with the high-technology instructional devices
- Computers were added to classroom / lab complex, as well as at clinical sites. The amount of computer technology incorporated into instruction and evaluation of student learning has increased in recent years
- Curriculum changes were made to bring the Program in compliance with the 126 Sh limit for the degree, to accommodate the common prerequisite mandates, and to improve the instruction and training in clinical microbiology portion of the curriculum
- Support from the clinical affiliates, as well as from personnel in non affiliate health care facilities remains as strong as ever
- UWF's Medical Technology Program continues to serve as a major source of well educated, well trained, certified and licensed clinical laboratory personnel for the local and regional laboratories.

### **1999-2000 NAACLS Review- Summary of program's strengths reported**

#### **Self –Study Review**

During the NAACLS review in 1999-2000 it was stated in the Self-Study Review Report that the University of West Florida's Medical Technology Program "appears to be well designed and administered, with students able to perform well on certification exams as well as ability to find employment".

#### **The Site-Visit Report listed the following as "Areas of Strength":**

- Dedicated Faculty
- Strong Administrative Support
- Well-equipped campus instructional laboratory
- Supportive clinical sites
- Tremendous community support for the Program

After seven years we are happy to report that the Program continues to be strong in all these areas and the state of the Program is excellent.

During the past 7 years the program not only sustained its high quality, but also has grown stronger with added resources and additional clinical sites. Over these years the curriculum was updated as needed by the changes in technology and in the field practice of clinical laboratory sciences. Students continue to perform well above the national means on the external examinations. The graduation and placement rates are excellent. Feed back from the recent graduates and their employers indicates a high level of satisfaction with the quality of our graduates' preparation for entry level competencies. Notes and letters from alumni of the Program are especially glowing with an appreciation of the strong knowledge base they acquired while going through this program. While acknowledging that a goal for achievement of excellence is a continuous never ending process, we are proud of these key indicators of the program's effectiveness and excellence.

Since the previous accreditation review in 1999-2000, the Program has obtained 3 additional hospitals as clinical affiliates, thus bringing the total number of clinical sites to 8. Shands Health

Care System is a major health care provider in East and Central Florida. Shands at University of Florida and Shands Jacksonville are premier teaching hospitals with state-of-the-art and cutting edge technology in laboratory services. We are pleased that UWF's Program is recognized for its quality and stability all across the state and that the recruiters from Shands Health Care System actively sought affiliation with our program. In the current environment of critical shortages of lab personnel, rising salaries and growing student interest in this profession, we are well poised for growth management with these additional clinical sites.

Support from our clinical affiliates as well as non-affiliate health care facilities remains as strong as ever. Health care industry in Northwest Florida is growing rapidly, with expansions of all the existing hospitals and additions of new physician groups. The UWF's Clinical Laboratory Sciences Program is recognized as a vital source of qualified clinical laboratory personnel. The program receives both moral support and material assistance from almost all the clinical laboratories in the region. We receive on a continuing basis expired reagents, test kits, equipment, study slides, case studies and information on the new technologies and so on. UWF alumni occupy not only a majority of staff positions, but are also in positions of management and supervision all across the Northwest Florida and beyond. Many of them are also serving on the CLS Program Advisory Committee. The University faculty and the administration consider this community's support as a great asset and plan to nurture these partnerships in the future.

#### **2007 NAACLS Site-Visit Report: List of Programs' Strengths**

- Well qualified, dynamic and experienced Program Director , has long history with program and respect from administration
- Motivated and well qualified faculty committed to Program's excellence
- Support from University Administration
- Strong support from the community
- Clinical affiliates with state of the art instrumentation provide enthusiastic support for the Program
- Opportunities for growth and development , especially in the area of Molecular Diagnostics
- Academically strong students
- Good resources both in student lab and clinical facilities
- Program has consistently received maximum years of accreditation
- Very large Advisory Committee covering communities of interest

## **Area of Weakness**

While the current Program has an excellent record of sustained quality and productivity the following are the weaknesses which need to be addressed by the administration:

- The Program Director has too high a teaching load. In addition to the administrative responsibilities, this faculty member has to teach half of the clinical curriculum. As the current Program Director retires, the next Program Director must be given a reasonably equitable work load and an equal opportunity for professional development and advancement through scholarly/creative activities.
- Overall, the faculty are stretched so thin over a variety of “must be done” tasks which are required for maintenance of accreditation, license, clinical sites, etc; that they do not have much time left for faculty development through research/scholarship/creative activities.
- The faculty has no time for substantial recruitment activities, while such activities are critical for enrollment. We have an excellent program and a wonderful profession, but there is a lack of information and incentives for bright students to consider this Program. We know how to increase enrollment in the Program, but have no time to do it.
- For 20 years the Program has performed its mission very well, but has not been given an opportunity to expand its Programs and Services. It deserves that chance.

Just the mere addition of one faculty line to the program could alleviate these weaknesses; allow for growth into cutting edge technology areas; and provide an equitable opportunity for faculty development.

## **Areas of Opportunities**

At present University of West Florida is in the process of building a School of Allied Health, concentrating on the areas of critical manpower shortages for health care industry in the region. In this newly established School of Allied Health, the Clinical Laboratory Sciences Program and the Nursing Program constitute the nucleus, CLS Program being the oldest and well established starship Program in health sciences at UWF. Looking to the future, with support from the administration, the Program has the potential to offer new programs and services to meet the staffing needs of the local and regional clinical laboratories.

### **Certificate Program in Molecular Diagnostics**

In this regard, a clear possibility is the offering of a certificate program in molecular diagnostics. This is especially an ideal goal, since the program is in Biology Department with a strong Cellular and Molecular Biology component in its offerings. Eventually the certificate program may be expanded into a BS degree program in molecular diagnostics. We have a large contingent of Biology majors who will be interested in such a degree.

### **Certificate Program for St of FL License as a Public Health Laboratory Scientist**

Pensacola is the site of a State of Florida Public Health Laboratory (part of the Bureau of Laboratories of the State Department of Health) which serves 13 counties in the Northwest Florida. In recent years this laboratory has been expanded in areas of Bioterrorism, Molecular Diagnostics and other services. They are also experiencing a shortage of qualified clinical laboratory personnel and expressed an interest in collaborating with our CLS Program to develop a Certificate Program to prepare Public Health Laboratory Scientists who are qualified to obtain State of Florida License. The CLS Program Faculty is interested in such a collaboration for the growth of the Program and to serve the community's needs.

## **G. Recommendations Based on Review Findings**

UWF CLS Program has been found to be in full compliance with NAACLS Standards.

No deficiencies were cited, no recommendations were made, and several strengths were listed.