Clinical Laboratory Science Program

The program is post-baccalaureate training that prepares graduates for positions as Clinical Laboratory Scientists (CLS). A licensed CLS performs the full spectrum of diagnostic tests in hospital clinical laboratories, in commercial reference laboratories, or in research and development for biotechnology companies. The 52 week long program is approved by the California Department of Public Health, Laboratory Field Services. We are in the process of submitting documentation to become accredited by NAACLS (the National Accrediting Agency for Clinical Laboratory Sciences). The program sponsor is California State University, Los Angeles.

The CSULA Clinical Laboratory Scientist Training Program consists of two components, a didactic component and a clinical practical training component. The lecture courses required for this program are offered through the College of Extended Studies and International Programs in Special Sessions to students accepted into the program. This is a joint program between Cal State LA and Cal Poly Pomona. The mission of the program is to prepare laboratory professionals with the technical, critical thinking, and management skills that will allow them to function at the highest level in the clinical laboratory, assume leadership roles in their working environment, and become leaders in their profession. In addition, we strive to instill in our trainees a love of continuous learning in and beyond their discipline.

Training Program Goals

1. To provide students with necessary academic instruction and professional training in the field of laboratory medicine and to meet employment needs of the California health care industry.
2. To produce skilled clinical laboratory workers who have competent working knowledge of the principles pertinent to the laboratory tests they are performing.
3. To prepare students to become accurate and reliable members of the healthcare team.
4. To teach students the role of the laboratory in the delivery of healthcare to the patient.
5. To develop positive attitudes in students and help them become professionals committed to delivering excellent healthcare.
6. To educate each student in a manner which encourages further education, participation in community service, maintenance of special interests, and development of leadership qualities in the field.
7. To achieve and maintain accreditation of the CLS program through the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).
8. To produce graduates who meet all the requirements to qualify for the California State licensure and national certification exam in Clinical Laboratory Science.
9. To produce graduates who pass the licensure exam in Clinical Laboratory Science upon completion of the program.
10. To maintain high academic and professional standards both for the program and students.
Prerequisites for Admission to the Program:

- A bachelor’s degree in biology or related science, received prior to admission to the program.
- 16 semester units (24 quarter units) of chemistry that must include classes in general chemistry (inorganic chemistry), analytical chemistry (quantitative analysis), organic chemistry, and biochemistry.
- 18 semester units (27 quarter units) of biological sciences that must include classes in immunology, hematology, and medical microbiology.
- 3 semester units (4 quarter units) of physics that must include instruction in the principles of light and electricity.
- Prefer at least 4 units of upper division biology laboratory instruction and at least one, and preferably all, of the following courses: physiology, genetics, biostatistics, and a lab class that includes molecular biology techniques.
- A minimum GPA of 2.75 on a 4-point scale in the required courses listed above. International students must have their transcripts evaluated by the AACRAO transcript evaluation service and their grades must be converted to a 4-point scale.
- These courses must have been completed within the last 7 years.
- For candidates with foreign degrees whose language of instruction was not English, a minimum 90 IBT, 230 CBT, or 575 PBT TOEFL score is required. IN ADDITION, an upper division course in hematology (with lab) or medical microbiology (with lab) taken in the U.S.A. with a grade of B or better IS REQUIRED.
- Three (3) letters of recommendation from upper division/graduate course instructors or work supervisors, with at least two letters from instructors.
- Pending application to Laboratory Field Services (http://www.cdph.ca.gov/programs/lfs) for a Clinical Laboratory Scientist Trainee License. Final acceptance for admission to the program is contingent upon receiving this license.
- A signed Statement of General Health form from the student’s primary healthcare provider.
- Candidates with foreign degrees must have U.S. citizenship or permanent residency in the U.S. to be admitted to the program.

Successful completion of the program leads to a certificate and makes the graduate to eligible to take the ASCP Medical Laboratory Scientist board exam to become State licensed and nationally certified (allowing graduates to work outside of California) and enter into a career in laboratory science. During the program year students spend 4 days per week at the clinical site laboratory and 1 day per week at the university in didactic instruction. Students are enrolled in graduate level classes that are transferrable to appropriate graduate programs; see list below.

**Required Courses (24 units).**

MICR 510 Advanced Studies in Hematology (5 units)
MICR 520 Advanced Studies in Transfusion Services (3 units)
MICR 530 Advanced Studies in Clinical Chemistry (8 units)
MICR 540 Advanced Studies in Medical Microbiology (8 units)

These courses are offered over three 13-week terms. As outlined below, Advanced Studies in Hematology (8 weeks) and Advanced Studies in Transfusion Services (5 weeks) are offered in fall term, Advanced Studies
in Clinical Chemistry is offered in winter term, and Advanced Studies in Medical Microbiology is offered in spring term.

<table>
<thead>
<tr>
<th>Wk</th>
<th>First Term MICR 510 and 520</th>
<th>Second Term MICR 530</th>
<th>Third term MICR 540</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phlebotomy including quality assurance/ Organization of blood and blood forming organs</td>
<td>Chemistry methodology</td>
<td>Specimen Collection/Inoculation/ Staining/Media</td>
</tr>
<tr>
<td>2</td>
<td>Structure and function of erythropoietic tissue</td>
<td>QC / QA/ Toxicology</td>
<td>Normal flora/Gram positive cocci/ Gram negative cocci</td>
</tr>
<tr>
<td>3</td>
<td>Introduction to anemias/ Hypochromis, microcytic anemias/ Macrocytic anemias/Aplastic and hypoplastic anemias</td>
<td>Liver function</td>
<td>Gram negative bacilli - Enterobacteraeaceae</td>
</tr>
<tr>
<td>4</td>
<td>Intracorpuscular defects of RBCs /Extracorpuscular defects of RBCs</td>
<td>Cardiac function</td>
<td>Nonfermenters/Vibrionaceae/ Pasteurellaceae/Other Gram negative rods</td>
</tr>
<tr>
<td>5</td>
<td>Structure and function of leukopoietic tissue/ Nonmalignant disorders of WBCs</td>
<td>Body fluid testing/ions</td>
<td>Gram positive rods/Mycobacteria</td>
</tr>
<tr>
<td>6</td>
<td>Myeloproliferative, Myelodysplastic disorders; Leukemias/Lymphomas</td>
<td>Acid base testing/ Carbohydrates</td>
<td>Anaerobes/Spirochaetales/ Rickettsia/Chlamydia</td>
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<tr>
<td>7</td>
<td>Primary and secondary hemostasis/Disorders of hemostasis</td>
<td>Urine chemistry / Renal function</td>
<td>Antibiotic susceptibility testing/Mycology</td>
</tr>
<tr>
<td>8</td>
<td>Review/Final in phlebotomy, hematology, and hemostasis</td>
<td>Urine chemistry / Renal function</td>
<td>Amoeba/Flagellates/Ciliates/ Apicomplexa/Microsporidium</td>
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<tr>
<td>9</td>
<td>Relevant principles and applications of immunology – Innate versus adaptive/ Antigen/Antibody structure and function/T cells/Complement</td>
<td>Genetic testing /Newborn screening</td>
<td>Nematodes/Trematodes/ Cestodes</td>
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<tr>
<td>10</td>
<td>ABO/Secretors/Lewis system/Rh system/ Typing/Crossmatch/AHG test/RBC antibodies and antigens</td>
<td>Endocrine/Enzyme testing</td>
<td>Virology</td>
</tr>
<tr>
<td>11</td>
<td>HDN/Compatibility testing/Transfusion reactions/Blood component therapy/Donors/Quality control</td>
<td>Protein testing/Lipids</td>
<td>Serology/Immunology</td>
</tr>
<tr>
<td>12</td>
<td>Molecular diagnostics</td>
<td>Tumor markers/ Autoimmune testing/Research methods</td>
<td>Blood, urine, wound, sputum, throat, urogenital, and GI cultures</td>
</tr>
<tr>
<td>13</td>
<td>Education and management/ Review for final exam</td>
<td>Review for final exam</td>
<td>Review for final and licensing exam</td>
</tr>
</tbody>
</table>
Current Clinical Sites:

Citrus Valley Health Partners: Queen of the Valley (West Covina) and Intercommunity campuses (Covina); students spend ½ year at each facility

Los Angeles County, Department of Health Services, facilities: Harbor-UCLA (Torrance), LAC-USC (Los Angeles), Martin Luther King (Los Angeles) and Olive View-UCLA (Sylmar)

Methodist Hospital of Southern California (Arcadia)

White Memorial Hospital (Adventist system, Los Angeles)

Students work, in close association with the staff at the various hospitals, with actual patient samples and learn all the procedures in the clinical laboratories. This provides each student with excellent preparation for careers upon graduation. Our clinical sites frequently hire the graduates that they have trained in this program.

Clinical rotations:

<table>
<thead>
<tr>
<th>Clinical Rotation</th>
<th>Length</th>
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<tbody>
<tr>
<td>Orientation, Safety and Phlebotomy</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Hematology and Coagulation</td>
<td>8 weeks</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>4 weeks</td>
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<tr>
<td>Pretransfusion Procedures (Blood Banking)</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Chemistry (Routine and Special)</td>
<td>12 weeks</td>
</tr>
<tr>
<td>Serology (Immunology)</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Microbiology</td>
<td>9 weeks</td>
</tr>
<tr>
<td>Parasitology</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Miscellaneous Topics and Review</td>
<td>5 weeks</td>
</tr>
</tbody>
</table>

Each clinical site has small variations in the rotations. The minimum length of time that students spend in each major section is listed in the table above.

Student progress is monitored throughout the year by the on-site education coordinators through direct observation and written, practical and oral examinations. Evaluations of student progress are reviewed with the student during and following completion of the various laboratory sections. In addition, students are asked to evaluate the general program, individual sections and the didactic part of the curriculum. This feedback is used for program improvement.

Written objectives and required performance standards are distributed to the students during orientation to the program. Students must maintain minimum performance standards of 70% (based on a straight grading scale) on all examinations and evaluations to continue in the program. However, this is the accepted minimum and students are strongly encouraged to perform at their highest level. Failure to
maintain at least minimum scores will lead to dismissal. Evaluation forms, evaluation and dismissal policies and the appeals and grievance procedure are detailed at orientation.

Application and Admission Procedure

Admission is by application only. Follow the link to the program website for downloadable forms and instructions.  http://www.calstatela.edu/academic/biol/clscgmb.php

A minimum science GPA of 2.75 is required. Transcripts from all schools attended must be provided along with 3 letters of recommendation (see forms on website); we prefer 2 of the recommendations be from university professors. A resume and a one or two page letter of interest in CLS must accompany other application materials.

Applications must be complete and applicants must meet all minimum requirements to be considered for the program. The admission committee, comprised of the program director, program education coordinator and faculty involved in the program, reviews all eligible applicants without regard to race, color, religion, national origin, sex, age or handicap. Top applicants are contacted for a scheduled interview by the selection committee and the education coordinators from the clinical affiliates. A standardized set of questions is asked of all candidates and ample time is provided for the applicants to ask any questions that they may have.

Student applications are accepted starting in October of each year, with the application deadline being the 3rd week of January. Selected students are offered interviews in March. After the interviews students are asked to rank order their clinical site preferences, and clinical sites are asked to rank order the interviewed candidates. The two lists are reconciled and offers of positions in the program at a specific training site are sent to accepted students shortly after the interview process. Students offered positions must confirm acceptance via email. Training starts the following September.

Students must be physically capable of completing all aspects of the training program. Accepted students must have the ability to perform various physical, technical and occupational skills involving vision, mobility, fine-motor skills and have the ability to communicate effectively in English.

Costs, Student Loans, Work Hours, other Topics

Currently, costs are $450 per unit ($10,800 total) with additional expenses required for liability insurance and proof/provision of health insurance, various immunizations (Hepatitis B, measles, mumps and proof of TB skin testing/clearance).

Students are required to purchase textbooks for personal use (no more than $450). The balance of training/study materials is provided by the clinical sites at no charge. Parking permits will need to be purchased when attending classes at the University (typically $90 per term here at CSULA).
Participation in the Federal Guaranteed Student Loan program is available; a FAFSA must be filed by interested students.

Students provide their own housing; accommodations are readily available in the surrounding communities. Meals during the training day are available in hospital cafeterias or students may bring meals from home.

Job related illnesses can be treated in the particular facility's emergency room for a fee. Any significant absences must be made up at the end of the training year.

Students are provided with protective garments at each clinical site. Appropriate, neat, street attire with closed-toe shoes are required in the laboratories.

Because the time commitment required for successful training is great, students are encouraged not to work during the training year. Outside work hours must not interfere with program commitments.

Work hours vary from section to section depending on the laboratory. Typical workdays begin at 7 or 7:30 AM and end at 3:30 or 4 PM. Students are not required to work weekends or holidays. Some clinical sites are able to offer supplemental employment if so desired, but it is NOT required as an integral part of training.

NAACLS Accreditation (in process): contact information:

We are currently working to achieve accreditation by the National Accrediting Agency for Clinical Laboratory Science (NAACLS).

For more information, you can contact NAACLS directly at: 5600 N. River Road, Suite 720, Rosemont, IL 60018 or by calling (773)714-8880. You can also reach them on the web by e-mailing info@naacls.org or by visiting www.naacls.org.

For more Program information contact:

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