Course Syllabus and Information

Description: This 3-unit laboratory class is designed to introduce the undergraduate or graduate student to contemporary microscopy techniques including atomic force microscopy (AFM), confocal microscopy (CFM), scanning tunneling microscopy (STM) and scanning electron microscopy (SEM). It is a cross-disciplinary course in recognition of the increasing loss of the traditional divisions of science. It meets for one 4-hour period each week. It is your responsibility to understand the material in this syllabus.

Outcomes: Students successfully completing this class will be able to:

- Operate advanced microscopes.
- Understand the basic operating principles of advanced microscopes.
- Make quantitative, semi-quantitative and qualitative measurements of various samples of interest to chemists, physicists, biologists, and geologists.
- Analyze, graph and perform various operations on data produced.
- Write summary reports on each instrumental technique.

Prerequisite: None. Enrollment by permission number with approval of one of the instructors listed below.

Instructors:

Professor Ernest Kwok (CFM)
3218 Citrus Hall
ernest.kwok@csun.edu
(818) 677 3383

Professor Henk Postma (STM)
1112 Live Oak Hall
postma@csun.edu
(818) 677 6152

Professor Simon J. Garrett (AFM)
2002 Eucalyptus Hall
simon.garrett@csun.edu (preferred)
(818) 677 3366

Professor Elena Miranda (SEM)
1204 Live Oak Hall
elena.miranda@csun.edu
(818) 677 4671

Laboratories: Laboratories start the first week of classes. Experiments take place in Eucalyptus Hall 2005B (AFM and STM), Chaparral Hall 5434 (CFM) and Live Oak Hall 1101 (SEM).

- Fridays 8:00 AM - 11:50 AM, Section 01
- Fridays 1:00 PM - 4:50 PM, Section 02

Office Hours: Kwok: Tuesday & Thursday 1-2 PM, Citrus Hall 3218, or by appointment (e-mail)
Postma: Wed 2-3 PM, Live Oak 1112, or by appointment (e-mail)

Garrett: Wednesday 10:00 - 11:30 AM, 2002 Eucalyptus Hall, or by appointment (e-mail).

Miranda: **Thursday-Wednesday 1 PM – 2 PM 9:00 – 10:00 AM**, Live Oak Hall 1204, or by appointment (e-mail)

**Accommodation:** Students with disabilities must register with the Center on Disabilities and complete a services agreement each semester. Staff within the Center will verify the existence of a disability based on the documentation provided and approve accommodations. The Center on Disabilities is located in Bayramian Hall, room 110. Staff can be reached at (818) 677 2684.

**Manual:** None required. Materials will be distributed by the instructors, either through physical copies or Moodle.

**Notebook:** A hardbound notebook is required to record information about each technique, operating parameters and/or sample information. Formal laboratory reports are not required to be written in the laboratory notebook.

**USB Flashdrive:** A USB flashdrive (PC format) is desirable to keep your own copies of images and data from the instrument computers.

**Drop Policy:** During the first three weeks, the course can be dropped without any change to your record.

**WWW:** Access to the web is highly recommended. Additional class resources will be available through the university Moodle system accessible from any computer on or off campus. You can access Moodle using the ‘myNorthridge portal’ login from the university homepage (www.csun.edu).

**Attendance:** Punctual attendance at the laboratory section in which you are enrolled is expected every session. You cannot attend other sections without permission of both instructors involved. If you are unable to attend a laboratory session because of an emergency you must inform your instructor prior to the laboratory session you will miss and provide valid documentation (doctor’s note, police accident report, military orders etc.) to your instructor within one week.

**Scheduling:** All experiments will be performed in pairs. Where possible students will be paired from different departments. Although data will be shared, you will be expected to write your own final summary report. As a team, you will work for three consecutive weeks on each technique then rotate to the next until you have completed all four rotations. The last three weeks of the semester is scheduled for writing your final report and - if necessary - repeating specific measurements.

**Your Reports:** Four summary reports, giving an overview of the instruments, methods and samples you studied, will be submitted at the end of the semester. Guidelines will be given for final report formats. PLEASE PAY ATTENTION to any due dates given by the instructors.
Your Instructor: Your instructor has complete authority during your session. You must follow their instructions. The instructor may expel you from a particular experiment if you are unruly, disruptive, unsafe, careless with equipment or otherwise act in a manner that interferes with the operation of the session; you will score zero for that experiment.

Dishonesty: Students should read Appendix E-2 through E-4 in the current course catalog. Unless otherwise stated, everything you turn in for course credit should be your own work. Academic dishonesty (‘cheating’) includes, but is not limited to, plagiarism, turning in a report without performing the experiment, interfering with another student’s work, removing chemicals or equipment from the laboratory, providing answers to other students, using notes, calculators or electronic means to obtain answers when not allowed, using forged documents to obtain an excused absence, copying calculations, and data or graphs from another student. Academic dishonesty IN ANY PART OF THIS COURSE WILL RESULT IN AN F GRADE for the course, regardless of any points earned. An F will be given to any colluding partners. IF YOU ARE REPEATING THIS CLASS, you may not reuse any previous materials. If in doubt, consult your instructor.

Electronics: Please turn off and put away all music players, phones and pagers during the laboratory session. If you must make a phone call, please do so outside the laboratory. You may not wear headphones or earbuds, including Bluetooth devices, during the session. Persistent and continued class disruption by electronic devices may result in you being expelled for that experiment.

Equipment: Much of the instrumentation you will use is fragile, expensive and essential to the operation of this and other classes. Please treat it with respect. If it does not appear to be working correctly, contact the instructor.

Points: Each instructor will provide specific instructions for completion of each component of the required material.

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<tr>
<th>Experiment</th>
<th>Homework</th>
<th>Final Report</th>
<th>Points</th>
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<tbody>
<tr>
<td>AFM</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>CFM</td>
<td>15</td>
<td>15</td>
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<td>SEM</td>
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<tr>
<td>STM</td>
<td>15</td>
<td>15</td>
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<tr>
<td>TOTAL POINTS</td>
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<td>120</td>
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Letter Grades: The guaranteed letter grades are assigned as follows:
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<tr>
<th>Percentage</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>&gt;85%</td>
<td>A</td>
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<tr>
<td>75-85%</td>
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<td>65-75%</td>
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<td>55-65%</td>
<td>D</td>
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<tr>
<td>&lt;55%</td>
<td>F</td>
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These outcomes align with the college-level learning outcomes “Ability to apply appropriate techniques of scientific and mathematical inquiry, and analyze and interpret results” and “Ability to engage the scientific and mathematical literature produced by others, and to disseminate scientific and mathematical observations and descriptions in both verbal and written presentation.” In addition, these outcomes align with the university-level fundamental learning competencies: “Intellectual and Practical Skills: CSUN graduates can effectively engage in inquiry and problem-solving, critical analysis, and creative thinking; they have quantitative literacy, are information competent and appreciate the role of these as life-long learning skills,” and “Communication Skills: CSUN graduates can communicate effectively through written, signed or spoken languages, through visual and audio media using text, video, graphics, and quantitative data, both individually and as a member of a team.”