

BIOL - 490 - Biology Study Abroad- Clinical Microbiology

WINTER-SESSION (1 UNIT LECTURE/ 2 UNITS LAB)

Research Experience in Clinical Microbiology



Course description

This course is designed to explore issues related with mechanisms of pathogenicity, control and epidemiology of infectious diseases. It aims to study current infectious disease related problems including control, prevention and emergent chemotherapy resistance. The objective is to introduce the students to recent topics in microbiology, the molecular aspects of microbial pathogenesis, the methodologies to perform epidemiological studies, and the most prevalent microbial pathogens in humans.

This course will give the students the tools and knowledge to understand the epidemiology and molecular mechanisms of infectious diseases and prepare them to understand and analyzed primary literature. Moreover, clinical cases will be discussed creating critical thinking skills.

Instructor:

Dr. María Soledad Ramírez.
Office: DBH 117A
Phone: (657)-278- 4562
Campus extension: 4562
Email: msramirez@fullerton.edu
Emails should include "BIOL 490"
in the subject line and your name
in the message.

OFFICE HOURS (DBH 117A)
TBD

Abroad Assistant Instructor:

Dr. Claudia M Barberis
Facultad de Farmacia y
Bioquímica
Hospital de Clinicas, UBA
Buenos Aires, Argentina

MEETINGS (Jan 2- Jan 19 2018)

On campus week (Week 1)

Off-campus weeks (Week 2-3)

Research Experience and lectures in Clinical Microbiology at
Hospital de Clinicas Jose de San Martin, UBA

Pre-departure meeting: TBD



PREREQUISITES

Core course and permission of instructor

GRADING

To pass the course, students must earn a passing grade (C or higher) in.

POINTS DISTRIBUTION	Undergrad	Graduates
Participation	30 points	20 points
Case solving	15 points	15 points
Lab notebooks	10 points	10 points
Assignments	45 points	45 points
Peer evaluations*	NA	10 points
	100 points	100 points

GRADE	POINTS
A	≥ 90%
A-	87-89%
B+	84-86%
B	80-83%
B-	77-79%
C+	74-76%
C	70-73%
C-	67-69%
D+	64-66%
D	60-63%
D-	57-59%
F	<57%

SPECIAL NEEDS

Please inform the instructor during the first week of classes about any disability or special needs that you may have that may require specific arrangements related to attending class sessions, carrying out class assignments, or writing papers or examinations. According to California State University policy, students with disabilities must document their disabilities at the Disability Support Services (DSS) Office in order to be accommodated in their courses. If your accommodations include testing you will be required to schedule your exams and/or quizzes through [TITANable](#). Additional information can be found at the [DSS website](#), by calling 657-278-3112 or email dsservices@fullerton.edu.

EXAMINATIONS

Case solving and Assignments: There will a case solving that needs to be solved and expose at the end of the course.

A final assignment with resolution and exposition of the lab work needs to be prepare to pass the course

Lab Notebooks: Each Laboratory has requirements for laboratory notebooks. Please, be sure to fulfill the requirements. Prior to each lab session, you should enter the date, title, and objectives for that day's activities. The notebook needs to be kept up to date since notebooks from randomly selected students can be collected and evaluated at any time. The notebook will be on announced date and evaluated for completeness, accuracy, and format.

Participation: The distribution of these points is at the discretion of the instructor. This includes participation, in class activity, case studies, preparation for lab, punctuality, group participation, etc.

Peer evaluations*: Only for graduate students

Public speaking is an essential skill in science, as well as in many other fields. It is also a learned skill, which means that people get better at it through practice, through feedback, and through the study of what is effective and not effective in the presentations of other people. To encourage thoughtful reflection on what works well and not-so-well in presentations, and to allow each of you to receive diverse feedback on your own presentations, you are assigned to complete evaluations of the presentation of two presentations during the semester. Please send by email to Dr. Ramirez the corresponding evaluation (msramirez@fullerton.edu).

No extra credits will offered.

ATTENDANCE POLICY

Regular attendance and participation is required for this course. Please contact your lecture or laboratory instructor by email if you miss a class meeting. Extended absences will have a negative impact on your ability to succeed in this class. **Please contact your instructor if you have concerns about your ability to participate in this course.**

ACADEMIC INTEGRITY

Academic Integrity is a requirement of this course and of the University. Academic honesty applies both to your performance on exams and on written assignments.

Plagiarism is the unacknowledged used of another's words or ideas as your own. Use your own words when writing. Use quotation marks and cite the source of any phrase that you "borrow". Changing one or two words in a sentence is still plagiarism!

Cheating is the use of another's work as your own. Copying another student's homework, looking at another student's exam, or using information from another student to enhance your performance on a task, are all examples of cheating.

Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. University policies are strictly enforced in this course. Please familiarize yourself with the

SAFETY

•In the event of an emergency such as earthquake or fire:

Take all your personal belongings and leave the classroom (or lab). Use the stairways located at the east, west, or center of the building.

Do not use the elevator. They may not be working once the alarm sounds.

Go to the lawn area towards Nutwood Avenue. Stay with class members for further instruction.

For additional information on exits, fire alarms and telephones, **Building Evacuation Maps** are located near each elevator.

Anyone who may have difficulty evacuating the building, please see me after class.

•Dial 911 on any campus phone, pay phone, or blue emergency phones to connect directly to University Police. Dialing 911 on your cell phone will connect with the Highway Patrol. Tell CHP dispatcher that CSUF Police are the responding agency. Stay on the line until asked to hang up.

•If you want to bring visitors to the classroom, you must obtain permission from the instructor in advance and must sign a volunteer form.

•Visitors to the lab must obtain permission from the Chair and must sign a volunteer form.

•There is no smoking within 20 feet of every campus building. This includes the MH balcony.

•Specific hazards or risks in the lab will be discussed prior to each experiment. If you have any questions about the safety of an experiment, please contact me.

•If there is a spill of a hazardous chemical, notify me immediately.

•Report all injuries to me or the Laboratory aide.

•All students must read and sign the departmental, "Laboratory safety procedures" form at the beginning of the semester.

EMERGENCY CAMPUS CLOSURE

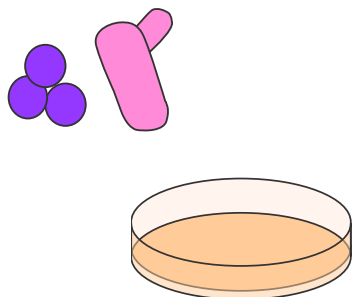
In the event of an emergency that disrupts normal campus operations or causes the University to close for a prolonged period of time due to circumstances such as an earthquake, we will do our best to continue the class via Blackboard/Titanium, if it is available. Therefore, as soon as possible after such an event and at least once a day, check the class Blackboard site and your CSUF email for messages and instructions. You can obtain emergency information about campus operations on the CSUF web site, via the Fullerton Campus Operation & Emergency Closure Line (657-278-4444) or the Irvine Campus Operation & Emergency Closure Line (657-278-8676).

WITHDRAWAL POLICY

The CSUF policy regarding withdrawal from classes (UPS 300.016) will be followed. After the first two weeks of the semester, students may be granted withdrawal ONLY by presenting compelling evidence outlining a physical, medical, or emotional condition that prevents completion of the course. Poor academic performance is not evidence of a serious reason for withdrawal. Students unable to produce official documentation will be required to take the grade they have earned in the class. Please refer to the course schedule for information on the last day to withdraw with a W grade. Important dates concerning registration or drops are contained in the CSUF Registration Guide available at <http://www.fullerton.edu/admissions/CurrentStudent/Registration.asp>

LABORATORY SAFETY

Always wear lab coat, gloves, and safety glasses when performing experiments. No open toe shoes. Unless you are completely sure of the dangers in manipulating any reagent or apparatus, consider them as hazardous. No eating or drinking in the lab at any time. Never mouth-pipette anything. If you use chloroform, ether or phenol do it inside the hood.



The students who complete this course will be able to:

- Know basic biologic aspects of microbial pathogenesis
- Understand and know microbial epidemiology
- Know the most important human pathogens
- Be aware of emergent and re-emergent pathogens
- Be familiar with different methods used in the identification of pathogens
- Critically evaluate primary literature
- Place a publication under analysis in the broad context of the current knowledge in the field
- Formulate research questions based on the new findings described in a primary literature.
- Propose strategies and methodologies to answer these research questions

Required Materials

You will need to have each of the following items:

Required:

- Lab notebook
- Lab coat
- Black or blue Sharpie

You are required to wear a lab coat and close-toed shoes at all times. This is for your own personal safety; some of these organisms are hazardous to human health, so please respect them and use common sense when handling them. When in doubt, please ask.

GENERAL LAB RULES:

1. NO EATING OR DRINKING OF ANY KIND IS PERMITTED IN THE LAB.
2. All students must wear closed-toed shoes.
3. All culture tubes are to be stored in racks. Never lay tubes on the bench top.
4. Keep long hair away from open flames.
5. At the beginning and end of each lab period, all benchtops are to be wiped down with disinfectant.
6. WASH YOUR HANDS after working with live organisms and before you leave the laboratory.
7. At the end of the lab period put all materials away in their place, clean all ink off of glassware and remove any tape/labels, place materials for disposal in the proper containers, wipe down all bench tops.



Research experience in Clinical Microbiology:

Specific areas that will be covered in this course are:

- 1) Organizations involved in Infectious Diseases Control
- 2) Collection, preservation and processing of clinical samples
- 3) Epidemiological studies- Outbreak studies
- 4) Microbial Flora and Pathogens- Host-parasite relationships, microbial pathogenesis and host defense mechanisms
- 5) Microorganisms involved in causing human disease
- 6) New technologies and the use molecular methods for direct detection and/or rapid identification of pathogens
- 7) Emerging and re-emerging pathogen
- 8) Antimicrobial therapy and emergence of multidrug resistant microbes

Laboratory experience

- Correct manipulation, transport and preservation of the samples
- Correct identification of bacterial species (phenotypic assays, MALDI-TOFF MS)
- Use of molecular techniques to detect and identify clinical pathogens
- Use of epidemiological techniques characterize the outbreak and/or relationship among studied isolates



TENTATIVE SCHEDULE

WEEK 1	LECTURE TOPIC/ LAB ACTIVITY
	Course Introduction and review of general concepts Lab rules and requirements
	Microbial Flora and Pathogens Processing of clinical samples Bacterial identification
	Case discussion Introduction of Molecular Epidemiological tools- Outbreak studies
	Relevant recent microbiology topics and introduction of emerging multidrug resistance pathogens
WEEK 2 and 3	Arrive at your departure airport (LAX) at least 3 h before our flight time. Join the rest of the class to fly to Buenos Aires, Argentina
	Research Experience and lectures in Clinical Microbiology a) Case study (complete characterization and correct identification of bacterial isolates)- b) Study of a CRE outbreak (Molecular techniques- Epidemiological studies) The last day every student will present a talk of 10 min explain the research conducted, results and conclusion, due to your instructor for grading.
Week 3	U.S. Arrival
Week 3	Students Final presentation

Suggested Bibliography

Manual of Clinical Microbiology- Murray et al. ASM Press

Microbiology: The Human Experience- Slonczewski J. Norton Ed. <https://digital.wwnorton.com/humanexperience>, <http://books.wwnorton.com/books/webad.aspx?id=4294990537>

Medical Microbiology. An Introduction to infectious diseases- Sherris

Primary Literature