

American University of Beirut
Faculty of Health Sciences
Systematic and Clinical Bacteriology
MLSP 204 (4 credits)
Spring Semester (AY 2019/2020)

Coordinator: Dr. Sami Ramia

Van Dyck Rm 325

Office Hours: by appointment

Email: sramia@aub.edu.lb

Time and Place: Lecture: MR 11:00-11:50 pm., VD 101

W 12:00-12:50 pm. VD 101

Lab Lecture: M 10:00-10:50 am, VD 101

Lab 1 Section 1: T 10:00-11:50 am, VD 403

Lab 1 Section 2: T 3:15-5:15 pm, VD 403

Lab 2 Section 1: W 8:00-9:50 am, VD 403

Lab 2 Section 2: W 10:00-11:50 am, VD 403

Lab Sections 1 and 2: R 3:15-4:15 pm, VD 403

Course Description

This course is designed to introduce students to the medically important bacteria, the disease they cause, clinical signs and symptoms of each disease and the laboratory diagnosis including isolation and biochemical characteristics. This course is divided into 3 lectures, 1 lab lecture and 3 labs.

Course Learning Outcomes (LOs)

Upon completion of this course, students should be able to:

1. Identify the biological samples needed to isolate medically important bacteria.
2. Compare the causative agents, the mode of transmission and clinical signs and symptoms of the various bacterial species.
3. Process various laboratory samples needed for bacterial identification.
4. Perform Antimicrobial susceptibility and antimicrobial resistance testing.
5. Perform the different biochemical tests used in bacterial identification.
6. Understand the measures to be taken for bacterial prevention and control.

Course Material and Readings

Suggested Reference Books:

1. Diagnostic Microbiology; Bailey and Scott's; 14th Ed.

The course material will include lecture handouts and reading assignments. The lecture handouts and PowerPoint presentations will be posted on Moodle prior to class.

Course Format

Information will be delivered to students in the form of Moodle handouts and assigned readings from reference books. Students are required to cover the readings prior to class for efficient participation. Quizzes on the covered material will be conducted to evaluate students.

Student Evaluation

Midterm	30%	LOs 1, 2, 3
Final Exam	35%	LOs 1-6
Laboratory	30%	LOs 1-6
Attendance & Participation	5%	

*Failing grade (below 60) requires a student to repeat the MLSP 204 course.

Course Outline

Week	Lecture	Topic/ Activity	Required Readings
Week 1 1/23/2020	Lecture 1	Gram-Positive Bacilli Non-branching, catalase-positive gram-positive bacilli (<i>Bacillus spp.</i>)	Chapter 15: Bacillus and Similar Organisms.
Week 2 1/27/2020	Lecture 2	Gram-Positive Bacilli Non-branching, catalase-positive gram-positive bacilli (<i>Listeria monocytogenes, Corynebacterium spp.</i>)	Chapter 16: Listeria, Corynebacterium, and Similar Organisms.
	Lecture 3	Gram-Positive Bacilli Non-branching, catalase-negative gram-positive bacilli (<i>Erysipelothrix rhusiopathiae, Lactobacillus spp., Gardnerella vaginalis</i>)	Chapter 17: Erysipelothrix, Lactobacillus, and Similar Organisms
	Lecture 4	Gram-Positive Bacilli Branching or partially acid-fast Gram-positive bacilli (<i>Nocardia spp., Streptomyces spp., Rhodococcus spp.</i>)	Chapter 18: Nocardia, Streptomyces, Rhodococcus, and Similar Organisms.

Week 3 2/3/2020	Lecture 5	Gram Negative Bacilli: Enterobacteriaceae spp. (<i>Escherichia coli</i> , <i>Salmonella spp.</i> , <i>Shigella spp.</i> , <i>Klebsiella spp.</i>)	Chapter 19: <i>Enterobacteriaceae</i> .
	Lecture 6	Gram Negative Bacilli: Enterobacteriaceae spp. (<i>Citrobacter spp.</i> , <i>Proteus spp.</i> , <i>Enterobacter spp.</i> , <i>Serratia marcescens</i>)	
	Lecture 7	Gram Negative Bacilli: Enterobacteriaceae spp. (<i>Yersinia spp.</i>)	
Week 4 2/10/2020	Lectures 8 & 9	Gram-Negative Bacilli and Coccobacilli (Non-Enterobacteriaceae) (MacConkey-Positive, Oxidase-Positive Gram-Negative Bacilli and Coccobacilli: <i>Pseudomonas spp.</i> , <i>Burkholderia spp.</i> , <i>Vibrio spp.</i> , <i>Aeromonas spp.</i> , <i>Plesiomonas shigelloides</i> , and <i>Chromobacterium violaceum</i>)	Chapter 21: <i>Pseudomonas</i> , <i>Burkholderia</i> , and Similar Organisms. Chapter 25: <i>Vibrio</i> , <i>Aeromonas</i> , <i>Plesiomonas shigelloides</i> , and <i>Chromobacterium violaceum</i> .
	Lecture 10	Gram-Negative Bacilli and Coccobacilli (Non-Enterobacteriaceae) (MacConkey-Negative, Oxidase-Positive Gram-Negative Bacilli and Coccobacilli: <i>Eikenella corrodens</i> , <i>Pasteurella spp.</i> , <i>Actinobacillus spp.</i> , <i>Kingella spp.</i> , <i>Cardiobacterium hominis</i> and <i>Capnocytophaga spp.</i>)	Chapter 28: <i>Eikenella corrodens</i> and Similar Organisms. Chapter 29: <i>Pasteurella</i> and Similar Organisms. Chapter 30: <i>Actinobacillus</i> , <i>Kingella</i> , <i>Cardiobacterium</i> , <i>Capnocytophaga</i> , and Similar Organisms.
Week 5 2/17/2020	Lecture 11	<i>Haemophilus spp.</i> (<i>H. influenza</i> , <i>H. parainfluenzae</i> and <i>H. ducreyi</i>)	Chapter 31: <i>Haemophilus</i> .
	Lectures 12 & 13	Gram-Negative Bacilli that are Optimally Recovered on Special Media (<i>Campylobacter spp.</i> , <i>Helicobacter spp.</i> , <i>Legionella spp.</i> , and <i>Francisella spp.</i>)	Chapter 33: <i>Campylobacter</i> , <i>Arcobacter</i> , and <i>Helicobacter</i> Chapter 34: <i>Legionella</i> Chapter 37: <i>Francisella</i>

Week 6 2/24/2020	Lecture 14	Gram-Negative Bacilli that are Optimally Recovered on Special Media <i>(Brucella spp. and Bordetella spp.)</i>	Chapter 35: <i>Brucella</i> Chapter 36: <i>Bordetella pertussis</i> and <i>Bordetella parapertussis</i>
	Lectures 15 & 16	Bacteria Not Characterized by Gram Stain <i>(Mycobacteria spp.)</i>	Chapter 42: <i>Mycobacteria</i>
Week 7 3/2/2020	Lectures 17, 18 & 19	Bacteria Not Characterized by Gram Stain Obligate Intracellular and Nonculturable Bacterial Agents <i>(Chlamydia spp. and Rickettsia spp.)</i> and <i>Spirochetes (Treponema spp., Borrelia spp. and Leptospira spp.)</i>	Chapter 43: Obligate Intracellular and Nonculturable Bacterial Agents Chapter 45: The Spirochetes
Week 8 3/9/2020	Lecture 20	Bacteria Not Characterized by Gram Stain <i>(Cell Wall-Deficient Bacteria: Mycoplasma spp. and Ureaplasma spp.)</i>	Chapter 44: Cell Wall-Deficient Bacteria: <i>Mycoplasma</i> and <i>Ureaplasma</i>
	Lectures 21 & 22	Anaerobic Bacteria <i>(Clostridium spp. and Bacteroides spp.)</i>	Section 13: Anaerobic Bacteriology Chapter 40: Overview and General Considerations Section 13: Anaerobic Bacteriology Chapter 41: Laboratory Considerations
TBD	Midterm		
Week 9 3/16/2020	Lectures 23, 24 & 25	Advanced Topics in Antimicrobial Resistance <i>(Bacterial Resistance e.g. ESBL, MRSA, CRE, VRE, mechanisms of D test, Imipenem Resistance, Hodge Test)</i>	Chapter 10: Principles of Antimicrobial Action & Resistance. Chapter 11: Laboratory Methods and Strategies for Antimicrobial Susceptibility Testing.
Week 10 3/23/2020	Lectures 26 & 27	Infections of the Urinary Tract <i>(The most common micro-organisms that colonize the urethra and are considered normal flora, and the most common community-acquired and</i>	Chapter 72: Infection of the Urinary Tract

		hospital-acquired urinary tract infections.)	
	Lecture 28	Genital Tract Infections (The normal flora of male and female reproductive systems and the microorganisms that are commonly associated with the genital tract infections)	Chapter 73: Genital Tract Infections
Week 11 3/30/2020	Lecture 29	Gastrointestinal Tract Infections (The differentiation between the normal flora and the pathogenic organisms distributed throughout the gastrointestinal tract and the infections of the upper and lower tract based on clinical manifestations)	Chapter 74: Gastrointestinal Tract Infections
	Lectures 30 & 31	Infections of the Upper Respiratory Tract (The most common etiologic agents responsible for upper respiratory tract infections including otitis infections)	Chapter 69: Upper Respiratory Tract Infections and Other Infections of the Oral Cavity and Neck Chapter 71: Infections of the Eyes, Ears, and Sinuses
Week 12 4/6/2020	Lecture 32 & 33	Infections of the Lower Respiratory Tract (The most common etiologic agents responsible for lower respiratory tract infections)	Chapter 68: Infections of the Lower Respiratory Tract
	Lecture 34	Infections of the Central Nervous System (The most common etiologic agents responsible for causing meningitis)	Chapter 70: Meningitis and Other Infections of the Central Nervous Systems
Week 13 4/13/2020	Lectures 35 & 36	Infections of the Central Nervous System (The most common etiologic agents responsible for causing meningitis)	Chapter 70: Meningitis and Other Infections of the Central Nervous Systems
Week 14 4/20/2020	Lectures 37 & 38	Bloodstream Infections	Chapter 67: Bloodstream Infections

		(The most common bacterial agents correlated with bloodstream infections with emphasis on bacteremia and septicemia)	
Week 15 4/27/2020	Lectures 39, 40 & 41	Miscellaneous Body Infections (The most common bacterial agents correlated with infections of body fluids, bones, bone marrows, solid tissues, eyes, ears, skin, soft tissue and wounds.)	Chapter 71: Infections of the Eyes, Ears, and Sinuses Chapter 75: Skin, Soft Tissue, and Wound Infections Chapter 76: Normally Sterile Body Fluids, Bone and Bone Marrow, and Solid Tissues

Course Requirements

- **Attendance:** Students are expected to attend all lectures and laboratory sessions. In case of absence from any session, students are responsible for the work done and for any announcements made in the missed session.

- **Examination:** Students must take the quizzes, unknowns and final exams on the set date. Make-up exams will be given only in case of emergencies or major illness. Only authorized medical reports will be accepted.
- **Dress Code:** Students will be expected to follow a dress code at the laboratory that follows the safety measures.
- **Academic Integrity:** Cheating and plagiarism will not be tolerated. Review the student Code of Conduct in the student handbook and familiarize yourself with definitions and penalties. If you are in doubt about what constitutes plagiarism, ask your instructor because it is your responsibility to know. The American University of Beirut has a strict anti-cheating policy. Penalties include failing marks on the assignment in question, suspension or expulsion from University and a permanent mention of the disciplinary action in student's records.
- **Students with Disabilities:** AUB strives to make learning experiences accessible for all. If you anticipate or experience academic barriers due to a disability (including learning difficulties, mental health, chronic or temporary medical conditions), please inform the instructor immediately or kindly register with the Accessible Education Office (AEO) (accessibility@aub.edu.lb; +961-1-350000, x3246; West Hall, 314') in order to ensure that you receive the support you need and to facilitate a smooth accommodation process.
- **Non-Discrimination – Title IX – AUB:** AUB is committed to facilitating a campus free of all forms of discrimination including sex/gender-based harassment prohibited by Title IX. The University's non-discrimination policy applies to, and protects, all students, faculty, and staff. If you think you have experienced discrimination or harassment, including sexual misconduct, we encourage you to tell someone promptly. If you speak to a faculty or staff member about an issue such as harassment, sexual violence, or discrimination, the information will be kept as private as possible, however, faculty and designated staff are required to bring it to the attention of the University's Title IX Coordinator. Faculty can refer you to fully confidential resources, and you can find information and contacts at www.aub.edu.lb/titleix. **To report an incident**, contact the University's Title IX Coordinator Trudi Hodges at 01-350000 ext. 2514, or titleix@aub.edu.lb. An anonymous report may be submitted online via Ethics Point at www.aub.ethicspoint.com