

**American University of Beirut
Faculty of Health Sciences
Introduction to Bacteriology**

**MLSP 203 Laboratory
Fall Semester (AY 2019/2020)**

Lab Instructor: Mrs. Mirna Bou Hamdan

Van Dyck Rm 319
Office Hours: by appointment
Email: mb154@aub.edu.lb

Time and Place: Lab Lecture: W 9:00-9:50 am, Nabil Boustany Auditorium
Lab Section 1: W 10:00-11:30 am, VD 403
Lab Section 2: W 11:30-1:00 pm, VD 403
Sections 1 and 2: R 2:00-3:00 pm, VD 403

Description

The laboratory component of MLSP 203 introduces students to the principles and basic laboratory methods used for bacterial identification including microscopy, culture and antibacterial susceptibility testing with emphasis on the implementation of laboratory safety techniques.

Learning Outcomes

Upon completion of this lab, students should be able:

- Apply the Laboratory safety measures required to work in a Bacteriology lab
- Demonstrate the role and types of microscopy used in a Microbiology Lab
- Practice the principles and procedures of bacterial staining (mainly Gram stain and acid fast stain)
- Prepare and distinguish between different types of media required for bacterial growth
- Inoculate selected bacterial species on culture media using different streaking techniques
- Evaluate colonial morphologies on different culture media
- Perform the biochemical tests required for the identification of selected genera of bacteria
- Apply the principles and the classical methods of Antibacterial susceptibility testing

Laboratory Material and Readings

Suggested Reference Books:

Diagnostic Microbiology; Bailey and Scott's; 13th Ed.

The laboratory material will include lecture handouts and reading assignments. The lecture handouts and PowerPoint presentations will be posted on Moodle prior to each lab session.

Student Evaluation

Midterm	30%
Unknown I	10%
Unknown II	10%

Attendance &

Participation 5%

Final Exam 50%

*The lab grade is 25% of the total MLSP 203 grade

Outline

Week/ Date	Lab Session	Lab Lecture	Lab Activity
Week 1 9/4/2019	1	Introduction to Laboratory Safety Regulations	Knowledge of the laboratory safety regulations and actions to be taken as set by the AUB's Environmental Health, Safety, and Risk Management Department e.g.: 1. Emergency numbers 2. Dos & DON'Ts 3. fire 4. biological spills (Lab practice) 5. disinfection (Lab practice) 6. antiseptics 7. Sterilization 8.waste disposal (Lab practice) 9. handwashing (Lab practice)
Week 2 9/11/2019	2	Microscopy in Bacterial Studies	Types of Microscopy with emphasis on Compound light microscope (Lab practice)
Week 3 9/18/2019	3	Bacterial Staining I: Gram Stain	Preparation and fixation of bacterial smears (practical training: Gram Stain).
Week 4 9/25/2019	4	Bacterial Staining II: Stains Other Than Gram Stain	Types and procedures of: 1.Structural stains 2.Fluorescent stains 3.Acid fast stains (Lab practice)
Week 5 10/2/2019	Unknown I		
Week 6 10/9/2019	5	Media Preparation	Preparation of different types of culture media with emphasis on media sterilization (Lab practice)
	6	Streaking Methods and Aseptic Transfer Techniques	Performance of different types of streaking techniques with emphasis on aseptic transfer from medium to another (Lab practice) e.g.: 1.From broth to broth 2.From broth to slant

			<p>3.From broth to deep</p> <p>4.From broth to agar</p> <p>5.Fishing technique and isolation of mixed culture</p>
10/10/2019	Midterm		
Week 7 10/16/2019	7	Laboratory Requirement for Bacterial Growth and the various Media used	<p>Requirements for bacterial growth in the lab and the various media used in bacterial isolation and identification with emphasis (Lab practice) on:</p> <ol style="list-style-type: none"> 1.Blood agar 2.Chocolate agar 3.MacConkey agar
Week 8 10/23/2019	8	Serial Dilution and Plate Count	<p>Criteria for the calculation of dilution factors along with the procedure of serial dilution and plate counting (Lab Practice)</p>
Week 9 10/30/2019	9	Antimicrobial Susceptibility Testing	<p>Practicing the basic principles and interpretation of antimicrobial susceptibility testing. Lab practice of disk diffusion technique, MIC, MBC and E-Test.</p>
Week 10 11/6/2019	10	Laboratory Identification of <i>Staphylococcus spp</i>	<p>Practicing the steps followed in the identification of <i>Staphylococcus spp.</i> e.g.:</p> <ol style="list-style-type: none"> 1. Catalase Test. 2. Coagulase Test 3. Mannitol Test 4. Novobiocin Test 5. D-test <p>The most commonly identified <i>Staphylococcus spp.</i> per site such as:</p> <ol style="list-style-type: none"> 1. <i>S. saprophyticus</i> in urine samples 2. <i>S. aureus</i> and <i>S. epidermidis</i> in skin and wound swabs
Week 11 11/13/2019	11	Laboratory Identification of <i>Streptococcus</i> and <i>Enterococcus spp.</i>	<p>Practicing the steps followed in the identification of <i>Streptococcus</i> and <i>Enterococcus spp.</i> e.g.:</p> <ol style="list-style-type: none"> 1. Bacitracin Test 2. CAMP Test 3. Optochin Test 4. Bile Esculin Test 5. SF Test 6. VRE Test <p>The most commonly identified <i>Streptococcus spp.</i> per site such as:</p> <ol style="list-style-type: none"> 1. <i>S. agalactiae</i>, in vaginal swabs 2. <i>S. progenies</i> in throat swabs 3. <i>S. pneumoniae</i> in sputum swabs

Week 12 11/20/2019	Unknown II	
	12	<p>Laboratory Identification of <i>Neisseria</i>, <i>Moraxella catarrhalis</i> and <i>Acinetobacter spp.</i></p> <p>Identification of <i>Neisseria</i>, <i>Moraxella catarrhalis</i> and <i>Acinetobacter spp.</i> the performance of:</p> <ol style="list-style-type: none"> 1.Oxidase Test 2.DNAse Test 3.Beta-Lactamase Test 4.CTA-Glucose/Maltose Tests <p>The introduction to the most commonly identified organisms per site such as:</p> <ol style="list-style-type: none"> 1. <i>Neisseria spp.</i>(vaginal swab, urethral swab) 2. <i>Moraxella catarrhalis</i> (nasopharyngeal-aspirate) 3.<i>Acinetobacter spp.</i> (skin samples, wound swabs, pus swabs).
Week 13 11/27/2019	Final Exam	

Lab 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 and adhere to laboratory safety measures.
- **Cell phones:** cell phones are not allowed in class.
- **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.