

Medical Microbiology

At-A-Glance - Lamar CISD

Professional Standards/Employability Skills/Technical Skills			
Ongoing Skills Imbedded All Year	<p>MM 1(A) The student will demonstrate verbal and non-verbal communication in a clear, concise, and effective manner. MM 1(B) The student will exhibit the ability to cooperate, contribute, and collaborate as a member of a team. Lab Procedures Ongoing MM 9(A) The student will identify and apply standard laboratory precautions. MM 9(B) The student will identify and apply microbiological safety practices in accordance with industry standards, including the proper handling, disinfection, and disposal of biological waste and maintenance of containment levels. MM 9(C) The student will identify and apply appropriate personal protection equipment (PPE) and transmission-based precautions, including precautions against droplet, contact, and airborne transmission. MM 9(D) The student will sterilize laboratory and medical equipment and instruments in accordance with industry standards. MM 9(E) The student will define and select different mechanisms of decontamination such as antiseptics, disinfection, and sterilization.</p>		
	Grading Period	Unit Name	Estimated Time Frame
Grading Period 1 29 Days	Lab Safety and Microscope	8 Days	1A, 1B, 3A, 3B, 3C, 3D, 9A, 9B, 9C, 9D, 9F
	<p>MM 1(A) The student will demonstrate verbal and non-verbal communication in a clear, concise, and effective manner. MM 1(B) The student will exhibit the ability to cooperate, contribute, and collaborate as a member of a team. MM 3(A) The student will identify advantages and limitations of models such as their size, scale, properties, and materials. MM 3(B) The student will analyze data by identifying significant statistical features, patterns, sources of error, and limitations. MM 3(C) The student will use mathematical calculations to assess quantitative relationships in data. MM 3(D) The student will evaluate experimental and engineering designs. MM 9(A) The student will identify and apply standard laboratory precautions. MM 9(B) The student will identify and apply microbiological safety practices in accordance with industry standards, including the proper handling, disinfection, and disposal of biological waste and maintenance of containment levels. MM 9(C) The student will identify and apply appropriate personal protection equipment (PPE) and transmission-based precautions, including precautions against droplet, contact, and airborne transmission. MM 9(D) The student will sterilize laboratory and medical equipment and instruments in accordance with industry standards. MM 9(E) The student will define and select different mechanisms of decontamination such as antiseptics, disinfection, and sterilization.</p>		
	Scientific Theory	4 Days	2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H
	<p>MM 2(A) The student will ask questions and define problems based on observations or information from text, phenomena, models, or investigations. MM 2(B) The student will apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems. MM 2(C) The student will use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards. MM 2(D) The student will use appropriate tools such as microscopes, slides, streak plates, inoculating loops, Bunsen burners, striker, hot plate, petri dish, agar and other growth mediums, reactive agents, personal protective equipment (PPE), disposable pipettes, lab glassware and instruments, bacterium and other live microbial agents, enzymes, computer software and probes, incubator, and autoclave. MM 2(E) The student will collect quantitative data using the International System of Units (SI) and United States customary units and qualitative data as evidence. MM 2(F) The student will organize quantitative and qualitative data using equipment such as graphing calculator, computer software and probes, graphic organizers. MM 2(G) The student will develop and use models to represent phenomena, systems, processes, or solutions to engineering problems. MM 2(H) The student will distinguish between scientific hypotheses, theories, and laws.</p>		
History of Scientists	7 Days	1C, 5A, 5B, 5C, 6A, 6B	
<p>MM 1(C) The student will locate, evaluate, and interpret career options, opportunities, and postsecondary transitions relating to the field of microbiology. MM 5(A) The student will analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing so as to encourage critical thinking by the student. MM 5(B) The student will relate the impact of past and current research on scientific thought and society, including research methodology, cost-benefit analysis, and contributions of diverse scientists and engineers as related to the content. MM 5(C) The student will research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) or health science field in order to investigate careers. MM 6(A) The student will examine the historical development of microbiology as it relates to health care of an individual in modern medicine. MM 6(B) The student will compare the roles, functions, and responsibilities of agencies governing infectious disease control.</p>			

	Medical Micro Data	5 Days	2E, 2F, 3B, 4A, 4B, 4C
	<p>MM 2(E) The student will collect quantitative data using the International System of Units (SI) and United States customary units and qualitative data as evidence.</p> <p>MM 2(F) The student will organize quantitative and qualitative data using equipment such as graphing calculator, computer software and probes, graphic organizers.</p> <p>MM 3(B) The student will analyze data by identifying significant statistical features, patterns, sources of error, and limitations.</p> <p>MM 4(A) The student will develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories.</p> <p>MM 4(B) The student will communicate explanations and solutions individually and collaboratively in a variety of settings and formats.</p> <p>MM 4(C) The student will engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.</p>		
	Microorganisms	5 Days	7A
MM 7(A) The student will classify microorganisms using a dichotomous key.			
Grading Period 2 27 Days	Inferences	15 Days	3B, 4A, 4B, 4C, 5A, 7A
	<p>MM 3(B) The student will analyze data by identifying significant statistical features, patterns, sources of error, and limitations.</p> <p>MM 4(A) The student will develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories.</p> <p>MM 4(B) The student will communicate explanations and solutions individually and collaboratively in a variety of settings and formats.</p> <p>MM 4(C) The student will engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.</p> <p>MM 5(A) The student will analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing so as to encourage critical thinking by the student.</p> <p>MM 7(A) The student will classify microorganisms using a dichotomous key.</p>		
	Microbial Growth	12 Days	7A, 7B
<p>MM 7(A) The student will classify microorganisms using a dichotomous key.</p> <p>MM 7(B) The student will prepare slides and discuss the differences between Gram positive and Gram negative bacteria such as the bacterial cell wall and the use of oxygen.</p>			
Grading Period 3 28 Days	Processes of MicroOrganisms - Microbial	11 Days	7A, 7B
	<p>MM 7(A) The student will classify microorganisms using a dichotomous key.</p> <p>MM 7(B) The student will prepare slides and discuss the differences between Gram positive and Gram negative bacteria such as the bacterial cell wall and the use of oxygen.</p>		
	Body Immune Response	11 Days	7F, 7G
	<p>MM 7(F) The student will identify the normal flora microorganisms of the human body.</p> <p>MM 7(G) The student will identify and differentiate between various pathogens, including opportunistic pathogens, hospital-acquired infections, community-acquired infections, and colonizing microorganisms.</p>		
	Categorize Diseases	6 Days	8B
MM 8(B) The student will categorize diseases caused by bacteria, including Rickettsia, fungi, viruses, protozoa, arthropods, and helminths.			
Grading Period 4 31 Days	Specific Immunity & Antibodies	15 Days	8C
	MM 8(C) The student will explain and interpret the body's immune responses and defenses against infection.		
	Pathogenic Microbes	16 Days	7G
MM 7(G) The student will identify and differentiate between various pathogens, including opportunistic pathogens, hospital-acquired infections, community-acquired infections, and colonizing microorganisms.			

Grading Period 5 30 Days	Infectious Diseases	5 Days	6A, 6B
	MM 6(A) The student will examine the historical development of microbiology as it relates to health care of an individual in modern medicine. MM 6(B) The student will compare the roles, functions, and responsibilities of agencies governing infectious disease control.		
	Infectious Process	5 Days	7B, 8A, 8B, 8C, 8D, 8E, 8G
	MM 7(B) The student will prepare slides and discuss the differences between Gram positive and Gram negative bacteria such as the bacterial cell wall and the use of oxygen. MM 8(A) The student will outline and explain the infectious disease process, including how pathogenic microorganisms affect human body systems. MM 8(B) The student will categorize diseases caused by bacteria, including Rickettsia, fungi, viruses, protozoa, arthropods, and helminths. MM 8(C) The student will explain and interpret the body's immune responses and defenses against infection. MM 8(D) The student will prepare a bacterial colony and evaluate the effects of anti-microbial agents such as narrow and broad-spectrum antibiotics. MM 8(E) The student will examine the environmental and social causes of the emergence and reemergence of diseases such as corona viruses, Ebola, malaria, tuberculosis, and polio. MM 8(G) The student will outline the role of governing agencies in monitoring and establishing guidelines based on the spread of infectious diseases.		
	Pathogens	10 Days	7G, 8A, 8B, 8D, 8F
	MM 7(G) The student will identify and differentiate between various pathogens, including opportunistic pathogens, hospital-acquired infections, community-acquired infections, and colonizing microorganisms. MM 8(A) The student will outline and explain the infectious disease process, including how pathogenic microorganisms affect human body systems. MM 8(B) The student will categorize diseases caused by bacteria, including Rickettsia, fungi, viruses, protozoa, arthropods, and helminths. MM 8(D) The student will prepare a bacterial colony and evaluate the effects of anti-microbial agents such as narrow and broad-spectrum antibiotics. MM 8(F) The student will research and discuss drug aureus-resistant microorganisms, including carbapenem-resistant Enterobacteriaceae, methicillin-resistant Staphylococcus aureus, vancomycin-intermediate/resistant Staphylococci, vancomycin-resistant enterococci, and emergent antibiotic-resistant superbugs.		
Microbiological Techniques	10 Days	7H	
MM 7(H) The student will isolate colonies and describe the morphology of microorganisms.			
Grading Period 6 27 Days	Drug-Resistant MicroOrganisms	5 Days	8F
	MM 8(F) The student will research and discuss drug aureus-resistant microorganisms, including carbapenem-resistant Enterobacteriaceae, methicillin-resistant Staphylococcus aureus, vancomycin-intermediate/resistant Staphylococci, vancomycin-resistant enterococci, and emergent antibiotic-resistant superbugs.		
	Capstone Lab	5 Days	
	Lab Procedures and Identification	15 Days	2D, 7A, 7C, 7D, 7E, 7F, 7G, 7I
	MM 2(D) The student will use appropriate tools such as microscopes, slides, streak plates, inoculating loops, Bunsen burners, striker, hot plate, petri dish, agar and other growth mediums, reactive agents, personal protective equipment (PPE), disposable pipettes, lab glassware and instruments, bacterium and other live microbial agents, enzymes, computer software and probes, incubator, and autoclave. MM 7(A) The student will classify microorganisms using a dichotomous key. MM 7(C) The student will identify chemical processes such as enzyme catalyst and osmotic potential of microorganisms. MM 7(D) The student will identify and discuss technologies used in a laboratory setting such as polymerase chain reaction (PCR), serology, enzyme-linked immunoassay (ELISA), and electrophoresis. MM 7(E) The student will prepare plates or active mediums to differentiate the factors required for microbial reproduction and growth. MM 7(F) The student will identify the normal flora microorganisms of the human body. MM 7(G) The student will identify and differentiate between various pathogens, including opportunistic pathogens, hospital-acquired infections, community-acquired infections, and colonizing microorganisms. MM 7(I) The student will interpret and explain the role of the culture and sensitivity report provided to the clinician.		
Semester Review and Testing	2 Days		