Microbiology/Infectious Disease

A. GOALS AND OBJECTIVES:

1. To promote the learning of microbiology related to infectious diseases in a clinical context.

2. To support student learning towards developing an approach to investigation, diagnosis, and treatment for common and important infectious diseases.

B. CURRICULUM PLAN SUMMARY:

Micro/ID objectives in Years 1 to 4 as outlined in the tables below are spiraled to add complexity as students transition from pre- clinical to clerkship years, with the goal of achieving exit competencies, primarily from the Expert domain, but others as well. These exit competencies are achieved by setting milestones for segments of the curriculum. The course and session-level objectives are associated with these milestones. With the exception of the Microbiology section in the Introductory module of Foundations I, micro/ID related session objectives in Years 1 and 2 will typically focus on students' ability to recognize clinical presentations of urgent and common infectious diseases, describe most likely pathogen(s) for the presentation, the investigations required and treatment.

To support student learning, lists of essential 'need to know' pathogens are provided at the end of this roadmap.

C. OBJECTIVES	
Years One and Two	**Topics**
Microbiology section of Introductory Module in Foundations I	Introduction to Microbiology
	Introduction to Bacteriology
	Introduction to Viruses and Human Disease
	Introduction to Fungi and Human Disease
	Introduction to Protozoa and other Parasites Impacting Human Health
	Host/Pathogen Interactions
	Antimicrobial Therapy and Resistance
	Infection Control and Public Health
Gastrointestinal	Infections of the GI Tract
	Peptic ulcer disease
	Infectious causes of diarrhea
	Acute and viral hepatitis
	Peritonitis
Respiratory	Respiratory microbiology
	Tuberculosis disease and TB infection (latent TB)
	Lower respiratory tract infections including influenza and covid-19
	Pediatric upper respiratory tract infections including Croup, Tracheitis, Epiglottitis, Retropharyngeal abscess/Tonsillar abscess, otitis media, otitis externa, sinusitis, pharyngitis
	Respiratory tract infections in special populations- COPD and Cystic Fibrosis
	Hemoptysis
	Pediatric Cough and Wheeze
	Pneumonia
Cardiovascular	Valvular disease and endocarditis
	Diabetic foot management

	Shock and Sepsis
Dermatology	Folliculitis
	Furuncles and Carbuncles
	Glandular infections including hordeolum and chalazion
	Cellulitis, erysipelas, impetigo,
	Fungal skin infections
	Infestations- scabies, lice and bed bugs
	Warts, growths, blisters/bullae and ulcers
	Toxin related infections
	Deep tissue infections including necrotizing fascitis
	Ulceroglandular infecitons including agents of bioterrorism
	Infectious rashes
	Lymphocutaneous
MSK	Osteomyelitis
	Septic arthritis
	Septic bursitis/tendonitis
	Bone and Joint infections
	Immunopathogenesis of Autoimmune Disease
Neurosciences	Acute meningitis
	Encephalitis
	Cerebral abscess
	Viral infections
	Ocular infections- Conjunctivitis, keratitis
Kidney and Urinary Tract	Urinary Tract Infection
	Cystitis
	Pyelonephritis
	Renal abscess
	Epididymitis and orchitis

	Asymptomatic bacteriuria
Reproductive system	Cervical dysplasia and HPV
	Viral and Bacterial Perinatal infections
	PID and tubo-ovarian abscess
	Urethritis
	Cervicitis
	Balanitis
	Vaginitis
	Valvular disease including warts and ulcers
	Puerperal sepsis- endometritis
	Mastitis/abscess
	Febrile neutropenia
Multi-system & Complex Care	Antibiotics review
	HIV
	Neonatal fever
	Sepsis and shock
	Recurrent infections/fevers in a child
	Infection control
	Shock and Sepsis
Year 3 and 4	Line/catheter infections

	Fever in the returning traveler (including tropical infections such as malaria and typhoid)
	Infections in immunocompromised hosts - splenectomy - importance of the innate immune system
	Vaccination recommendations in different populations - infancy and childhood - elderly - splenectomy Vaccination for infection prevention and control
	Bites (human and animal)
	Blood and body fluid exposures

Pathogen List:

Pathogens listed in the **Essential Tables** are an inventory of infectious agents for which graduating medical students should be able to recognize clinical presentations, understand diagnostic tests, and provide management plans (including an appropriate antimicrobial agent.)

Essential to know Gram positive cocci	
Genus	*Species*
Staphylococcus	aureus, Coagulase Negative Staphylococci
Streptococcus	viridans group, pneumoniae, Beta-hemolytic streptococci (grp A & B)
Enterococcus	
Essential to know Gram positive bacilli	
Genus	*Species*
Clostridium	difficile, tetani
Listeria	
Essential to know Gram negative bacilli	
Genus	*Species*
Escherichia	coli
Helicobacter	pylori
Klebsiella	
Pseudomonas	aeruginosa
Salmonella	

Shigella	
Essential to know Gram negative coccobacilli	
Genus	*Species*
Bordetella	pertussis
Haemophillus	infuenzae type B, influenzae non-typable
Essential to know Gram negative cocci	
Genus	*Species*
Neisseria	meningitidis, gonorrhea
Essential to know – Other bacteria	
Genus	*Species*
Chlamydia	trachomatis
Respiratory Atypical Infections (Chlamydophyla pneumoniae, Mycoplasma pneumoniae), Legionella pneumophila	
Mycobacterium	tuberculosis, avium complex
Treponema	pallidum
Essential to know – yeasts/molds	
Genus	*Species*
Candida	
Dermatophytes (Trichosporon, Microsporum, Epidermophyton)	
Aspergillus	
Cryptococcus	
Essential to know – parasites/worms	
Genus	*Species*
Cryptosporidium	
Enterobius	
Plasmodium	falciparum
Giardia	
Essential to know – viruses	
Human immunodeficiency virus	
Epstein-Barr virus	
Herpes simplex virus	
Varicella zoster virus	
Influenza	
Respiratory syncytial virus	
Norovirus	
Hepatitis A virus	
Hepatitis B virus	
Hepatitis C virus	
Enterovirus	
West Nile virus	

Human papilloma virus	
Measles	
Covid-19 and MPox as new pathogens	