

COURSE OUTLINE

(1) GENERAL

MD-401 Mechanisms of disease and therapeutics III

SCHOOL	Medical		
ACADEMIC UNIT	Basic and Clinical Sciences		
LEVEL OF STUDIES	1 st Cycle		
COURSE CODE	MD-401	SEMESTER	Year 4 / Semester 7 & 8 (Fall and Spring)
COURSE TITLE	Mechanisms of disease and therapeutics III		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
	10	20	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Core		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>Musculoskeletal System</p> <p>Theme 1: Inflammatory arthritis <i>Mechanisms of disease</i></p> <ul style="list-style-type: none"> • Describe the process of acute inflammation at microscopic and macroscopic level. • List the inflammatory mediators involved in inflammatory arthritis. • Describe the histology of synovitis as seen in rheumatoid arthritis psoriatic arthritis and crystal arthropathy. • Revise the structure and function of bone, cartilage, joints and skeletal muscle. • Describe the nature and significance of rheumatoid factor and anti-citrullinated C peptide (Anti-CCP/ACPA) antibodies. • Describe the pathophysiology of rheumatoid arthritis • Describe the pathophysiology of the spondyloarthropathies

- Outline the typical plain X ray features of rheumatoid arthritis, psoriatic arthritis and advanced ankylosing spondylitis
- Discuss the Clinical presentation diagnosis and differential diagnosis of Rheumatoid arthritis and the spondyloarthropathies (Psoriatic arthritis, Ankylosing spondylitis, Reactive arthritis, Enteropathic arthritis)

Clinical assessment and Management

- Describe the use of ultrasound in the assessment and management of inflammatory arthritis.
- Describe the role of MRI in the assessment of axial spondyloarthropathy.
- Describe the components of history taking in the assessment of a patient with acute arthritis in one or more joints (taking into account onset, joint distribution, associated features and past and family history) in order to formulate a differential diagnosis.
- Describe the components of taking a history in a person with established arthritis (including past and present treatment and impact of the disease on the life of the patient and their family)
- Revise the examination of all parts of the musculoskeletal system (starting in this part of the course, with wrist and hand examination in a rheumatology context)
- Discuss the drug and non-drug management of Rheumatoid arthritis
- Discuss the drug and non-drug management of the spondyloarthropathies as a family of conditions as well as the individual subtypes (Psoriatic, Reactive, Enteropathic and Ankylosing Spondylitis)
- Using rheumatoid arthritis as an example, explain the role of the multidisciplinary team in the management of rheumatic diseases (rheumatologist, physiotherapist, occupational therapist, ward pharmacist, psychologist, dietician and specialist nurse)
- discuss the use of ultrasound in rheumatology.
- Describe the characteristic ultrasound findings of inflammatory arthritis

Pharmacology and therapeutics

- Describe the mode of action, uses, side effects and any necessary blood monitoring of Methotrexate, Leflunomide, Hydroxychloroquine and sulphasalazine.
- Describe the mode of action, uses and side effects of biologic agents used in Rheumatoid arthritis and the spondyloarthropathies (Anti-TNF α , Anti-B cell, anti-IL6 Anti-IL17 and Anti-IL23 agents)
- Briefly describe the mode of action and uses of Janus Kinase (JAK) inhibitors in rheumatology
- Describe the mode of action, side effects and uses of corticosteroids in rheumatology and other inflammatory diseases.
- Outline the dose equivalence of various forms of corticosteroids in clinical use (prednisolone, methylprednisolone, hydrocortisone and dexamethasone)
- Describe the mode of action, side effects and uses of nonsteroidal anti-inflammatory drugs (NSAIDs)
- Compare and contrast COX2 selective versus older 'traditional' NSAIDs
- Briefly outline the indications and risks of intra-articular corticosteroid injections

Impact of disease

- Discuss the cost effectiveness of using expensive novel disease modifying drugs in rheumatology (e.g. biologic agents) using rheumatoid arthritis as a model.
- Outline the financial and general public health impact of rheumatoid and other forms of inflammatory arthritis.

Theme 2: Osteoarthritis, crystal arthropathy and metabolic bone diseases

Mechanisms of Disease

- Revise the structure and function of cartilage and bone.
- Outline urate metabolism from purine intake to excretion.
- Outline causes of high serum uric acid
- Describe calcium and vitamin D metabolism including the involvement of intestine, liver and kidney, skin, bone and parathyroid gland.
- Explain the link between calcium and Vit D metabolism with deficiency of the two.
- Describe bone turnover, the phases of remodelling and the influencing factors.
- Explain bone mineralisation and the factors influencing it.
- Briefly outline congenital and acquired causes of low vitamin D
- Explain the pathophysiology of the following:
 - Osteoarthritis
 - Gout
 - Pyrophosphate arthropathy (pseudogout)
 - Osteoporosis
 - Osteomalacia and rickets
 - Rickets
 - Paget's disease of bone

Clinical Assessment and Management

- Describe the clinical features (signs, symptoms, diagnosis and differential diagnosis) and causes of the following:
 - Osteoarthritis
 - Gout
 - Pseudogout
 - Osteoporosis
 - Osteomalacia and rickets
 - Paget's disease of bone
- Revise the examination of all parts of the musculoskeletal system (starting with the foot and ankle, hip and knee)
- Describe the relevant investigations used to diagnose and the pharmacological and non-pharmacological management of the following:
 - Osteoarthritis
 - Gout
 - Pseudogout
 - Osteoporosis
 - Osteomalacia and rickets
 - Paget's disease of bone
- Describe the typical X ray features of osteoarthritis Osteomalacia gout and Paget's disease of bone

Pharmacology and therapeutics

- Describe the mode of action and use in osteoporosis of the following
 - Bisphosphonates
 - Anti – RANK ligand monoclonal antibody
 - Selective oestrogen receptor modulators (SERMs)
 - Parathyroid Hormone (Teriparatide)
- Describe the mode of action and use of allopurinol, colchicine and the newer xanthine oxidase inhibitors (e.g. febuxostat) in the management of hyperuricaemia and gout
- Describe the rationale for use of bisphosphonates in Paget's disease of bone.

Impact of Disease

- Describe the global impact of Osteoarthritis and Osteoporosis including financial burden and strategies for tackling this.
- Describe the strategies for prevention of Osteoporosis and rickets on a world-wide scale.

Epidemiology and Public Health

- Interpret population pyramids.
- Discuss the impact of demographic change and population ageing on public health
- Describe the advantages of ethnography in Explaining the experiences of musculoskeletal conditions

Theme 3: Autoimmune connective tissue disease and principles of vasculitis

Mechanisms of Disease

- Revise the components and function of the immune system
- Explain the pathophysiology of autoimmunity including the development of autoantibodies and the distinction between pathogenic and non-pathogenic types.
- Differentiate between organ-specific and non-organ specific autoimmunity with examples.
- Outline the nature, clinical relevance and methods for detecting Antinuclear antibodies.
- List the antibodies to extractable nuclear antigen (ENA), commonly used in clinical practice and for each, list the clinical associations (Ro, La, Scl-70, Anti-centromere, Anti-Histone, Anti-Sm, Jo-1, Anti-U1RNP, Anti- pm Scl)
- Describe the nature and significance of anti-dsDNA antibodies including clinical use, sensitivity and specificity.
- Describe the nature and significance of anti-cardiolipin, anti- b2 Glycoprotein -1 antibodies and of lupus anticoagulant as well as their clinical use and role in investigation of recurrent miscarriage.
- Explain Raynaud phenomenon and differentiate between primary and secondary forms, including causes and disease associations.
- Classify vasculitis according to size of involved vessels and describe the typical histological findings in temporal arteritis, granulomatous angiitis and microscopic polyangiitis
- Classify vasculitis in terms of primary and secondary explaining the difference and giving examples of each.
- Describe what is meant by cANCA, pANCA and anti GBM antibodies.

Clinical Assessment and Management

- Differentiate systemic lupus from skin lupus
- Differentiate Systemic sclerosis from localised scleroderma
- Describe the clinical features (symptoms, signs and criteria for diagnosis) of the following:
 - Systemic Lupus Erythematosus,
 - Sjogren syndrome,
 - Antiphospholipid syndrome,
 - Systemic sclerosis
 - Polymyositis and dermatomyositis
 - Mixed connective tissue disease
- Describe the clinical presentation of polymyalgia rheumatica and Temporal arteritis explaining their connection and overlap
- Briefly describe the clinical features and characteristic organ involvement of Granulomatous angiitis, Churg Strauss syndrome Goodpasture syndrome, microscopic polyangiitis and Henoch Schoenlein purpura
- List the characteristic antibody associations of:
 - Systemic Lupus Erythematosus
 - Sjogren syndrome
 - Antiphospholipid syndrome
 - Systemic sclerosis
 - Mixed connective tissue disease

- Outline the antibody associations of Granulomatous angiitis and Goodpasture syndrome
- List the disease associations of cANCA and pANCA
- Outline the management of systemic lupus erythematosus

Theme 4: Infection, autoinflammatory and miscellaneous rheumatic diseases and pain syndromes

Mechanisms of Disease

- List the commonest microorganisms causing septic arthritis.
- Describe the genetic background of familial mediterranean fever and Behcet's disease
- Describe the typical histological features of sarcoidosis.
- Define the terms pain, chronic pain and chronic widespread pain syndrome.
- Explain how culture affects the way patients experience and express pain.

Clinical Assessment and Management

- Describe the clinical features and differential diagnosis of septic arthritis
- Differentiate between septic arthritis and reactive arthritis
- Describe the clinical features and method of diagnosis of familial mediterranean fever
- Outline the clinical features and describe the diagnostic criteria for Behcet's disease
- Describe the various forms of sarcoidosis (skin, lung, extrapulmonary and Lofgren syndrome)
- Describe the clinical features and diagnostic criteria of fibromyalgia.
- Describe the immediate management of suspected septic arthritis
- Briefly outline the intermediate and longer-term management of septic arthritis
- Briefly describe the basic management of ulcers and of thrombosis in Behcet's disease
- Outline the management of hypercalcaemia of sarcoidosis
- Describe the various components of managing a patient with fibromyalgia

Pharmacology and Therapeutics

- Describe the mode of action, uses and side effects of colchicine
- Describe the use of colchicine in Behcet's disease, familial mediterranean fever, gout and pericarditis
- Revise the mode of action, side effects and uses of Pregabalin, amitriptyline and duloxetine and outline their use in fibromyalgia.

Impact of Disease

- Describe the long-term effects on a joint with septic arthritis
- Outline the impact on the individual and their family in cases of fibromyalgia
- Describe ways to help patients with fibromyalgia function effectively in their home, workplace and society in general.

Theme 5: Bone and soft tissue regional pain, trauma, and surgery

Mechanisms of disease

- Revise the macroscopic structure of muscle bone tendons and ligaments.
- Describe the use of plain X ray and of CT and MRI scan in musculoskeletal pain and trauma.
- Revise the anatomy of the shoulder, elbow and ankle
- Revise the anatomy of the carpal tunnel
- Explain how mutations in genes encoding structural proteins cause disease and illustrate with examples.

Clinical Assessment and Management

- Revise the examination of all parts of the musculoskeletal system (starting with the shoulder, elbow and spine).
- Describe the components of history taking in a person with a suspected fracture.

- Describe the classification of fractures in orthopaedics.
- Describe the management of the various types of fractures.
- Describe the indications for surgery in fractures.
- Describe the immediate assessment and management of a patient with major trauma.
- Describe the indications for joint replacement surgery in rheumatology and orthopaedics
- Describe the role of arthroscopy in orthopaedics and rheumatology
- Explain the anatomical nature, clinical features and management of the following:
 - Rotator cuff syndrome/shoulder tendonitis and subacromial bursitis
 - Lateral and medial epicondylitis (tennis and golfer's elbow)
 - De Quervain tenosynovitis
 - Trochanteric bursitis
 - Suprapatellar and infrapatellar bursitis.
 - Morton's neuroma
 - Tarsal tunnel syndrome
- Describe the symptoms, clinical assessment and investigation of suspected carpal tunnel syndrome
- Describe the conservative and surgical management of carpal tunnel syndrome
- Describe the assessment, with important features in the history and examination of a person with acute or chronic back pain
- Describe the multidisciplinary management of a person with back pain

Impact of Disease

- Outline the long-term sequelae of fractures at particular sites of the skeleton (e.g. joint line or vertebrae)
- Outline the economic impact and cost effectiveness of joint replacement surgery.
- Describe the economic burden of back pain on a global scale and suggest ways to prevent back pain.
- Understand the medicolegal aspects of chronic back pain related to work injuries.

Medical Psychology

- Understand the multidimensional nature of pain.
- Explore historical and modern theories of pain.
- Identify the factors contributing to chronic pain.
- Recognize the impact of psychological factors on pain perception and management.

Neurology and Mental Health

Theme 1: Coma, Trauma and Epilepsy

Mechanisms of Disease

- Define coma and identify its potential causes.
- Explain traumatic brain injury, including concussion, post-concussion syndrome, traumatic brain syndrome, and diffuse axonal injury.
- Differentiate between traumatic herniation syndromes: central, uncal, and subfalcine.
- Describe the pathophysiology of seizure disorders and define epilepsy.
- Classify seizures into generalized (tonic-clonic, absence, tonic, clonic, atonic), partial (simple and complex), and febrile seizures.
- Discuss the epidemiology and aetiologies of seizures.

Clinical Assessment and Management

- Describe the clinical presentation of coma and related conditions.
- Explain the use of the Glasgow Coma Scale in assessing coma severity.
- Discuss the process of localizing dysfunction in a patient with coma.
- Identify brainstem reflexes, posturing, and other reflexes to formulate a differential diagnosis.

- Outline laboratory investigations for evaluating coma.
- Differentiate between coma, persistent vegetative state, locked-in syndrome, and brain death.
- Describe the clinical presentation of seizure disorders and epilepsy.
- Describe the approach to diagnosing epilepsy, including definitions and further testing (EEG, imaging, etc.)
- Explain the use of functional MRI (fMRI) in diagnosing epilepsy and its benefits for pre-surgical planning, brain function mapping, and understanding the functional impact of seizures.
- Discuss specific epilepsy syndromes, such as Lennox-Gastaut, Rolandic, and Juvenile myoclonic epilepsy.
- Demonstrate the initial evaluation and management of head trauma, including raised intracranial pressure.
- Outline the management of status epilepticus and provide first aid for seizures.
- Describe the mechanism of action and indication of the main types of anti-seizure drugs and their side effects.
- Address special considerations, including driving and epilepsy, pregnancy in women with epilepsy, and psychogenic seizures.

Impact of Disease

- Discuss strategies for preventing traumatic brain injuries and seizures, including public health initiatives and safety measures.
- Describe the factors influencing the prognosis of patients with coma, traumatic brain injury, and epilepsy.
- Analyze the public health implications of epilepsy and traumatic brain injuries, including the burden on healthcare systems and societal costs.

Medical Ethics

- Outline ethical and legal issues in decision-making for treatment of patients who lack capacity
- Identify challenges for clinical practice

Theme 2: Neurodegenerative Disorders.

Mechanisms of Disease

- Define dementia and delirium, highlighting their differences and similarities in terms of pathophysiology and effects on higher functions such as cognition, language, memory, and executive function.
- Discuss the underlying causes of dementia and delirium, focusing on pathophysiological mechanisms.
- Describe the role of the basal ganglia in motor function and its involvement in neurodegenerative disorders.
- Explain the classification of movement disorders as hypo- or hyper-kinetic, with examples.
- Differentiate between idiopathic Parkinson's disease and other Parkinsonian syndromes (e.g., PSP, CBGD, Vascular, MSA) with respect to pathophysiology.
- Differentiate between types of tremors (resting, action, postural) based on their underlying mechanisms.
- Describe the pathophysiological features of conditions such as dystonia, adult tic disease, essential tremor, Huntington's disease, stiff person syndrome, chorea, ballism, myoclonus, Wilson's disease, and paroxysmal dyskinesias.
- Explain how expansion of triple repeats cause disease and illustrate this with relevant examples.
- Define the term genetic anticipation and illustrate with examples.

Clinical Assessment and Management

- Describe the clinical presentation of dementia and delirium, including key symptoms and signs.
- Outline the diagnostic approach for dementia and delirium, including common diagnostic tools and criteria.
- Discuss the clinical characteristics and diagnostic criteria of common types of dementia, such as Alzheimer's disease, frontotemporal dementia (e.g., Pick's disease), progressive supranuclear palsy, Lewy body disease, vascular dementia, Huntington's disease, Parkinson's dementia, and metabolic dementias.
- Discuss the clinical presentation and diagnostic approach for infections causing dementia, such as Creutzfeldt-Jakob disease and HIV-related dementia.
- Outline the principles for management of dementia.
- Differentiate between idiopathic Parkinson's disease and other Parkinsonian syndromes (e.g., PSP, CBGD, Vascular, MSA) in terms of clinical diagnosis and treatment strategies.
- Describe the pharmacologic and surgical treatment options for Idiopathic Parkinson's Disease (IPD).
- Describe the mechanism of action and indication of the main types of drugs involved in Parkinson's disease and their side effects.

Impact of Disease

- Discuss the epidemiology of major neurodegenerative diseases, including dementia and Parkinson's disease, focusing on prevalence, incidence, and risk factors.
 - Analyze the public health implications of neurodegenerative disorders, including their impact on healthcare systems and society.
 - Describe the characteristics, challenges, and needs of informal carers who take care of a person with dementia.
 - Outline the stereotypes against older people and explain how older age is presented as a form of social dependency.
 - Describe the advantages of ethnography in understanding the experiences of musculoskeletal conditions
- #### Medical Psychology
- Outline brain hemispheric asymmetry and hemispheric dominance.
 - Outline the role of neuropsychological testing.
 - Describe the different types of neuropsychological tests used for assessing the functioning of different cortical areas.
 - Outline the role of testing in Neuropsychiatry and Neurorehabilitation.

Medical Ethics and Sociology

- Describe ethical issues in Huntington's disease, for patients, families, health professionals
- Outline key ethical and legal issues faced by older people in healthcare, particularly those with limited capacity or dementia.
- Examine the legal frameworks that protect older individuals from neglect and abuse
- Analyse the implications of resource allocation, including debates on age-based rationing of care.
- Explain doctors' ethical requirements and commitments to work with diversity, ensure equity, and tackle stereotypes and discrimination.
- Discuss and practise the ethical principles for working with diversity, while ensuring equity, and tackling stereotypes and discrimination.

Theme 3: Stroke and Cerebrovascular disease

Mechanisms of Disease

- Describe the normal anatomy and blood supply of the central nervous system (CNS), and identify common vascular abnormalities such as cerebral aneurysms, carotid artery stenosis, and vertebral artery dissection.
- Explain the symptoms associated with disruptions in specific vascular territories of the CNS.
- Differentiate between types of thrombotic strokes, including cerebral artery occlusion, cerebral infarction, and lacunar strokes.
- Differentiate between types of embolic strokes, including cerebral embolism and intracerebral hemorrhage, and discuss conditions like subarachnoid hemorrhage and hypertensive encephalopathy.
- Identify key features of metabolic encephalopathies, such as fluctuating levels of consciousness and asterixis.

Clinical Assessment and Management

- Recognize the clinical signs of a transient ischemic attack (TIA) and outline the initial assessment approach.
- Describe the clinical features and anatomical localization of aphasia, apraxia, agnosia, and neglect, providing clinical examples of each.
- Describe the diagnostic workup for TIA and stroke, including imaging techniques (CT, MRI) and other investigations (echocardiogram, carotid Doppler, and atrial fibrillation assessment).
- Discuss the acute management of stroke, including the use of antiplatelet drugs, fibrinolytic therapy, and angiographic interventions, and identify contraindications and time windows for these treatments.

Impact of Disease

- Evaluate the public health impact of stroke and cerebrovascular diseases, considering their prevalence and burden on healthcare systems.
- Discuss prevention strategies for stroke, including lifestyle changes and medical interventions to reduce risk factors.

Theme 4: Neuromuscular, Demyelinating and Inflammatory Disorders

Mechanisms of Disease

- Describe the pathophysiology and clinical presentation of myasthenic syndromes.
- Classify intrinsic muscle disorders, such as dystrophinopathies and muscular dystrophies.
- Outline mitochondrial, inflammatory, systemically induced, and toxic myopathies.
- Recognize and differentiate between radiculopathy, mononeuropathy (including mononeuropathy multiplex), and polyneuropathy.
- Describe the pathophysiology and common presentations of Multiple Sclerosis (MS) and other demyelinating diseases.
- Describe acute disseminated encephalomyelitis and its relationship to MS.
- Discuss leukoencephalopathies, including progressive multifocal leukoencephalopathy (PML), posterior reversible encephalopathy syndrome (PRES), and central pontine myelinolysis.
- Describe adrenoleukodystrophy and its impact on the nervous system.
- Outline common immune disorders affecting the nervous system, such as sarcoidosis, diabetes, lupus, antiphospholipid antibody syndrome, and thyroid disease.

Clinical Assessment and Management

- Explain the utility of various diagnostic tests for neuromuscular disorders.
- Describe a systematic approach to diagnosing and managing peripheral nerve lesions and dysfunction.
- Diagnose, evaluate, and treat Amyotrophic Lateral Sclerosis (ALS).

- Recognize, evaluate, and treat immune-mediated neuropathies, including Guillain-Barre syndrome, chronic inflammatory demyelinating polyneuropathy (CIDP), multifocal motor neuropathy (MMN), and M-protein associated neuropathies.
- Discuss the evaluation and treatment options for Multiple Sclerosis (MS), including its various clinical courses and prognosis (benign, relapsing-remitting, primary progressive, secondary progressive).

Impact of Disease

- Describe the epidemiology of Multiple Sclerosis (MS) and other demyelinating diseases.
- Analyze the public health implications of neuromuscular and demyelinating disorders, including their impact on healthcare systems and society.

Medical Ethics

- Identify and critically analyze ethical dilemmas in Multiple Sclerosis, and the complexity of doctor-patient and patient-family relationships, reproductive issues, justice in healthcare.

Theme 5: Headache and CNS Infections

Mechanisms of Disease

- Explain the implications of space-occupying lesions in the cranial and spinal areas.
- Discuss the different types of nervous system tumours, both benign and malignant.
- Describe the dynamics of hydrocephalus (including normal pressure) and other obstructive conditions (e.g., Arnold-Chiari malformation, pseudotumor cerebri/idiopathic intracranial hypertension).
- Describe the epidemiology of bacterial meningitis across different age groups and the impact of specific vaccines.
 - Rabies
 - Flaviviruses such as West Nile Virus
 - Japanese encephalitis virus
 - St. Louis encephalitis virus
 - Tick borne encephalitis viruses

Clinical Assessment and Management

- Demonstrate proficiency in obtaining a history and conducting a physical examination for headache, focusing on identifying key signs such as meningismus, papilledema, eye movement abnormalities, and visual dysfunction.
- Differentiate between primary headache disorders (e.g., migraine, tension-type, cluster) and describe their clinical presentation.
- Differentiate between secondary headache disorders (e.g., subarachnoid haemorrhage, low-pressure headache, idiopathic intracranial hypertension, temporal arteritis, chronic daily headaches) and describe their clinical presentation.
- Discuss the diagnostic approach and evaluation of facial pain syndromes.
- Recognize clues in the epidemiology, clinical presentation, and laboratory findings suggestive of specific causes of meningoencephalitis.
- Discuss the initial approach to a patient with suspected bacterial meningitis, including the need for brain imaging prior to lumbar puncture.
- Analyse cerebrospinal fluid (CSF) findings characteristic of different types of meningitis and encephalitis.
- Explain the consensus case definition of encephalitis and describe the diagnostic approach to a suspected case, including imaging, molecular, and serological investigations.
- Discuss treatment options for primary and secondary headache disorders.
- Be familiar with definitive treatment regimens for major pathogens causing acute bacterial meningitis and their possible complications.

Impact of Disease

- Evaluate the public health implications of CNS infections, including the burden on healthcare systems.
- Describe the epidemiology of meningitis and encephalitis, focusing on incidence, prevalence, and risk factors.
- Discuss prevention strategies for meningitis and encephalitis, including the role of vaccines and post-exposure prophylaxis.

Theme 6: Cranial Nerves and Cerebellar Dysfunction

Mechanisms of Disease

- Review the anatomy of the visual pathways in relation to conditions causing visual loss and optic disc abnormalities.
- Examine the anatomy of eye movements and their control, focusing on conditions that lead to abnormalities such as diplopia and nystagmus.
- Analyse the anatomy of the cavernous sinus and its relevance to cranial nerve dysfunctions.
- Explore the anatomy of the cerebellum and its connections, emphasizing its role in cerebellar diseases and ataxias.
- Define syncope and presyncope, and explain their pathophysiology, including their relationship to neurogenic syncope, autonomic failure, and orthostatic hypotension.

Clinical Assessment and Management

- Localize the site of dysfunction through appropriate examination techniques.
- Differentiate between monocular and binocular visual loss.
- Identify the causes of Horner syndrome and other pupillary lesions, such as Adie's and Argyll Robertson pupils.
- Identify optic disc abnormalities, including papilledema, drusen, optic neuritis, and ischemia, and discuss possible causes.
- Recognize common cranial nerve lesions and dysfunctions, such as optic neuropathy and oculomotor nerve palsy, including their causes, treatment, and prognosis.
- Describe the findings in Bell's palsy.
- Outline and describe the treatment of Ramsay Hunt syndrome, vestibulocochlear lesions and dysfunction, glossopharyngeal neuralgia, and accessory and hypoglossal nerve palsies.
- Describe the various types of vertigo, their pathophysiology, and treatment.
- Describe the association and implications of tinnitus, diplopia, dysarthria, and other signs of brainstem dysfunction with vertigo.
- Describe diagnostic and treatment manoeuvres for vertigo.
- Describe the signs and symptoms of cerebellar disease.
- Describe and identify cerebellar haemorrhage and infarction, alcoholic cerebellar degeneration, infectious cerebellitis, and paraneoplastic degeneration.
- Discuss the various ataxias, including Friedreich ataxia, genetic ataxias, and Miller Fisher syndrome.
- Identify major gait disorders, including hemiparetic, akinetic rigid, frontal, waddling, proprioceptive, and psychogenic.

Impact of Disease

- Analyse the public health implications of cranial nerve and cerebellar dysfunctions, including their impact on quality of life and healthcare systems.
- Discuss the prognosis and long-term outcomes of cranial nerve and cerebellar disorders, including factors that influence recovery and quality of life.
- Explore prevention strategies for conditions leading to cranial nerve and cerebellar dysfunction, such as lifestyle modifications and early intervention in risk factors.

- Evaluate the role of rehabilitation and support services in managing chronic cranial nerve and cerebellar disorders, focusing on improving patient independence and reducing disability.

Theme 7: An Introduction to Adult Psychopathology.

- Explain the definitions of cognitive empathy and sympathy and identify the differences between the two.
- Outline the most up to date research evidence on the impact of empathy on patient outcomes.
- Outline, based on current research evidence, the changes medical students' empathy undergoes during an undergraduate medical degree.
- Describe what is Psychopathology.
- Outline the methods employed in the diagnosis of psychological and psychiatric disorders.
- Outline the treatments often used in the treatment of psychiatric and psychological disorders.
- Outline the most common adult psychological and psychiatric disorders.

Theme 8: Adult Mental Disorders.

Anxiety Disorders.

- Describe anxiety disorders.
- Outline the diagnosis of anxiety disorders.
- Outline the prevalence and aetiology of anxiety disorders.
- Describe the treatment approaches of anxiety disorders.

Mood Disorders

- Describe the diagnosis of depression disorders.
- Outline the prevalence and aetiology of depression.
- Describe the treatment approaches of depression.
- Understand causes and interventions on Suicidal Ideation.

Eating Disorders

- Identify the Psychological Factors Affecting Eating Habits.
- Outline the most important eating disorders.
- Explain the role of psychological interventions to eating disorders.
- Outline the role of psychological therapy to healthy eating.

Schizophrenia

- Describe Schizophrenia.
- Outline the diagnostic criteria of Schizophrenia.
- Describe the prevalence and aetiology of Schizophrenia.
- Outline the treatment approaches of the disorder.

Substance Misuse

- Outline the different types of substances often abused.
- Describe the impact that different substances have on human behaviour.
- Outline the types of treatments offered to people suffering from substance addictions.
- Outline the most common drugs of abuse, including their overdose presentation and treatment and their withdrawal symptoms
- Understand the role of clinical Assessment on Alcohol Abuse.

Personality Disorders

- Define personality disorders and outline the main features of common personality disorders.
- Explain their interaction with other psychiatric disorders, and how co-morbidity can impact on progress and outcome.

- Describe therapeutic approaches used in treatment of severe personality disorders.

Theme 9: Child Psychopathology

An Introduction to Child Psychopathology.

- Outline the most common childhood psychiatric disorders.
- Outline the epidemiology, the method of assessment, diagnosis and treatment of childhood anxiety disorders.
- Outline the epidemiology, the method of assessment, diagnosis and treatment of childhood affective disorders.

Autism

- Outline the epidemiology and the method of assessment of autism.
 - Describe the diagnosis and treatment of autism.
- Attention Deficit Hyperactivity Disorder
- Outline the epidemiology and the method of assessment of ADHD/ADD.
 - Describe the diagnosis and treatment of ADHD/ADD.

Learning Disabilities

- Recognise when a patient has a learning disability and to be aware of the affect that this can have on a person's life.
- Outline the changing demographics and health needs of this population
- Understand the workings of integrated health and social care teams for people with a learning disability and the importance of making reasonable adjustments.

Social aspects of mental illness

- Explain the social determinants of mental illness.
- Explain the link between labelling, stigma and mental illness.
- Describe how societies produce stereotypes against mental illness.

Medical Ethics

- Outline ethical and legal aspects of medical errors, negligence, and malpractice in clinical practice
- Understand the scope of iatrogenic harm, risks, and the systemic influences on medical errors.
- Identify causes, non-reporting factors, and approaches for reducing human error in clinical practice.
- Describe the duty of candour and the issue of whistleblowing
- Explore the relevance of principles of informed consent and autonomy in the context of medical errors, focusing on disclosure and ethical decision-making.

Theme 10: Psychological Therapies and Interventions

An Introduction to Psychoanalysis.

- Outline the origins of Psychoanalytic theory.
- Outline the main characteristics of the Psychoanalytic Theory.
- Outline the advantages and disadvantages of this theory in the treatment of Psychological and Psychiatric disorders.

Learning, Behavioural Therapy and Behaviour Modification

- Outline the origins of Behavioural Therapy.
- Outline the main characteristics of the Behavioural Therapy.
- Describe the different techniques employed in the Behavioural Therapy Approach.
- Outline the advantages and disadvantages of this approach in the treatment of Psychological and Psychiatric disorders.

Cognitive Behavioural Therapy

- Outline the origins of Cognitive Behavioural Therapy.

- Outline the main characteristics of the Cognitive Behavioural Therapy.
- Describe the different techniques employed in the Cognitive Behavioural Therapy Approach.
- Outline the advantages and disadvantages of the Cognitive Behavioural Therapy Approach in the treatment of Psychological and Psychiatric disorders.
- Clinical Applications of CBT.

Epidemiology and Public Health

- Explain the importance of Evidence Based Medicine
- Apply the PICO approach to search for evidence
- Outlines the main concepts of systematic reviews and Meta-analysis
- Explain heterogeneity in evidence synthesis
- Interpret forest plots
- Explain publication bias and interpret funnel plots
- Evaluate the evidence from systematic reviews and meta-analyses
- Determine the level of evidence and strength of recommendation, and apply it to practice
- Explain how evidence can influence public health policy
- Describe the importance of guideline development in the context of public health
- Critically appraise literature

Climate change and health

- Examine the direct and indirect impacts of climate change on mental health

Medical Ethics

- Outline definitions, views and models of disability and disability rights, with reference to their ethical implications
- Define Intellectual Disability (ID) and identify potential barriers ID patients face when trying to access health care services
- Identify the challenges in provision of ethical and appropriate care for patients with disability and the role of effective communication when caring for patients with ID.

Skin

Theme 1: Inflammatory skin conditions

Mechanisms of disease

- Describe the aetiology and natural history of acne vulgaris, eczema, psoriasis, dermatitis, rosacea
- Discuss the role of allergens in the aetiology of skin disease.
- Describe the systemic conditions associated with atopy.
- Describe the systemic manifestations of psoriasis.
- Discuss the significance of family history in inflammatory skin conditions.

Clinical Assessment and Management

- Describe the range of clinical presentations and differential diagnoses of acne vulgaris, eczema, psoriasis, dermatitis, rosacea
- Describe a systematic and logical approach to the investigation and management of acne vulgaris, eczema, psoriasis, dermatitis, rosacea
- Select appropriate blood tests and other investigations for each of these conditions.
- Identify lifestyle factors that may contribute to the development and progression of the inflammatory skin conditions.
- Discuss the role of standardised severity score in the assessment of the severity and impact of the inflammatory skin conditions.
- Outline the role of non-pharmacological treatments such as light therapy in the management of inflammatory skin disease.

Pharmacology and Therapeutics

- Describe the pharmacology (mechanism of action, adverse effects, clinical indications, place in therapy, mode of administration) of drugs used in the treatment of acne vulgaris, eczema, psoriasis, dermatitis, rosacea

Impact of Disease

- Describe the differences in inflammatory dermatological conditions based on age, gender, ethnicity, and socioeconomic status, and understand their implications for diagnosis and treatment.
- Discuss the protective practices and measures necessary to minimise skin irritation due to hazardous substances in the workplace.

Theme 2: Skin infections and infestations

Mechanisms of disease

- Describe the life cycle and routes of transmission of the following microorganisms which are associated with skin conditions.
 - Herpes simplex
 - Human papilloma virus
 - Staphylococcus aureus
 - Dermatophytes
 - Exanthemata
 - Viral or bacterial childhood infections including Measles, S. pyogenes scarlet fever, Rubella, Parvovirus B19, varicella zoster (chickenpox) and coxsackievirus (hand foot and mouth disease).
 - Mycobacterium leprae
- Outline the body's inflammatory and immune responses to dermal infection.
- Parasitology
- Describe the life cycle and modes of transmission of the scabies mite and the common lice affecting humans.

Clinical Assessment and Management

- Describe the range of clinical presentations and differential diagnoses of the skin conditions caused by
 - Herpes simplex
 - Human papilloma virus
 - Staphylococcus aureus
 - Dermatophytes
 - Scabies mite
 - Head, body and pubic lice
- Describe a systematic and logical approach to the investigation and management of conditions caused by
 - Herpes simplex
 - Human papilloma virus
 - Staphylococcus aureus
 - Dermatophytes
 - Scabies mite
 - Head, body and pubic lice.
- Select appropriate investigations for each of these conditions.

Pharmacology and Therapeutics

- Describe the pharmacology (mechanism of action, adverse effects, clinical indications, place in therapy, mode of administration) of drugs used in the treatment of
 - Herpes simplex
 - Human papilloma virus
 - Staphylococcus aureus

- Dermatophytes
- Scabies mite
- Head, body and pubic lice

Impact of disease

- Describe the differences in infective dermatological conditions based on age, gender, ethnicity, and socioeconomic status, and understand their implications for diagnosis and treatment.
- Outline the precautions necessary to limit the spread of highly infective skin conditions in closed communities such as a school.

Theme 3: Neoplastic skin conditions

Mechanisms of disease

- Describe the mechanisms by which UV light causes damage to the skin.
- Describe the cell of origin, histology, progression, and mode of spread of
 - Basal cell carcinoma
 - Squamous cell carcinoma
 - Malignant melanoma
- Describe the cell of origin, histology, and significance of
 - Actinic keratosis
 - Bowen's disease
 - Simple naevus
 - Compound naevus
 - Lentigo malignans
- Discuss the prognostic factors in malignant melanoma including the thickness of the lesion.

Clinical Assessment and Management

- Describe the clinical presentations, diagnostic features and differential diagnosis of
 - Basal cell carcinoma
 - Squamous cell carcinoma
 - Malignant melanoma
 - Actinic keratosis
 - Bowen's disease
 - Simple naevus
 - Compound naevus
 - Lentigo malignans
- Describe a systematic and logical approach to the investigation and management of
 - Basal cell carcinoma
 - Squamous cell carcinoma
 - Malignant melanoma
 - Actinic keratosis
 - Bowen's disease
 - Simple naevus
 - Compound naevus
 - Lentigo malignans
- Explain the role of skin biopsy in the investigation of these lesions.
- Discuss the indications for staging investigations in skin malignancies and describe the appropriate investigations for staging malignant melanoma and squamous cell carcinoma.
- Discuss the role of surgery, radiotherapy, laser, and cryotherapy in the management of
 - Basal cell carcinoma
 - Squamous cell carcinoma
 - Malignant melanoma

- Actinic keratosis
- Bowen's disease
- Simple naevus
- Compound naevus
- Lentigo malignans

Pharmacology and Therapeutics

- Describe the pharmacology (mechanism of action, adverse effects, clinical indications, place in therapy, mode of administration) of chemotherapeutic agents used in the treatment of malignant melanoma and squamous cell carcinoma.
- Discuss the concept and role of immunotherapy in the management of malignant melanoma.
- Describe the pharmacology (mechanism of action, adverse effects, clinical indications, place in therapy, mode of administration) of chemotherapeutic agents used as UV protection.

Impact of disease

- Discuss the risk factors for skin cancer differentiating between the risk of BCC, SCC, and malignant melanoma.
- Explain the geographic and demographic distribution of skin cancer.
- Prevention
- Discuss the effectiveness of public education campaigns for the prevention of skin cancer.

Medical Psychology

- Identify psychological impacts on specific skin diseases.
- Explore the efficacy of psychological and behavioral interventions on skin conditions and diseases.
- Understand the role of integrated Dermatological and Psychological Care for the patient's well-being.

Climate Change and Health

- Examine the direct and indirect impacts of climate change on skin conditions and the mechanisms involved

Medical Ethics and Leadership in Medicine

- Understand the organizational structure of healthcare institutions
- Define patient safety and patient safety culture in healthcare
- Evaluate systemic and human factors and their implications for patient safety.
- Describe how bias and epistemic injustice contribute to medical errors and patient care issues
- Understand how to report errors through appropriate channels and how to participate in root cause analysis to prevent future errors
- Describe methodologies used in quality improvement, including Plan-Do-Study-Act cycles.
- Describe ethical Implications of technology in healthcare.

Haematopoietic System

Theme 1: Leukaemias

Mechanisms of disease

- Define leukaemia, distinguishing between acute (AML, ALL) and chronic (CML, CLL) forms based on clinical and laboratory findings.
- Describe key chromosomal abnormalities for each type of leukaemia and the mechanism of action of BCR-ABL in CML.
- Describe the pathophysiology and natural history of tumour lysis syndrome and ATRA syndrome.

Clinical Assessment and Management

- Compare and contrast the clinical symptoms, diagnostic pathways, and prognostic factors for acute and chronic leukaemias.
- Discuss basic management principles, the treatment and progression monitoring for each of the common leukaemias.

Pharmacology and Therapeutics

- Identify the drugs commonly used in the treatment of leukaemias and discuss their side effects.
- Recognise the importance of neutropenia and outline the management of a patient with neutropenia.

Impact of Disease

- Discuss the prognosis of different types of leukaemia.
- Consider public health issues related to leukaemia, such as screening and early detection.

Theme 2. Lymphoproliferative Disorders

Mechanisms of disease

- Define lymphoma.
- Discuss the pathology of Hodgkin's and common non-Hodgkin's types, including characteristic chromosomal translocations.

Clinical Assessment and Management

- Compare and contrast the clinical manifestations of Hodgkin's and non-Hodgkin's lymphomas.
- Outline the investigative approaches, and staging criteria for Hodgkin's and non-Hodgkin's lymphomas.
- Outline the management strategies for Hodgkin's and non-Hodgkin's lymphomas.

Impact of disease

- Discuss the prognosis of different types of lymphoma.
- Discuss the public health implications of lymphoma awareness and prevention.

Theme 3. Myeloproliferative and Myelodysplastic Disorders

Mechanisms of disease

- Differentiate between myelodysplasias and myeloproliferative disorders, naming key conditions and their relationships.
- Explain the mechanisms behind erythrocytosis, myelofibrosis, and myelodysplastic syndromes (including both morphological characteristics and clinical symptoms).
- Classify Myelodysplastic syndromes based on the severity of the disease and describe their natural history.

Clinical Assessment and Management

- Compare and contrast the clinical presentation of the common myeloproliferative and myelodysplastic disorders.
- Outline the investigation and treatment approaches for myeloproliferative and myelofibrotic conditions.

Impact of Disease

- Discuss the prognosis and potential complications of myeloproliferative and myelodysplastic disorders.
- Consider public health issues related to these disorders, such as genetic counselling and awareness.

Theme 4. Plasma Cell Dyscrasias

Mechanisms of disease

- Describe the pathophysiology and natural history of myeloma and distinguish it from benign conditions like MGUS.
- Describe the biochemical abnormalities in myeloma.

Clinical Assessment and Management

- Discuss the clinical presentations of myeloma.
- Outline the common complications of myeloma.
- Outline investigation, staging, and treatment strategies for myeloma and related conditions (e.g., solitary plasmacytoma and Waldenstrom's macroglobulinemia).

Impact of Disease

- Discuss the prognosis of the plasma cell dyscrasias.
- Consider public health issues related to plasma cell dyscrasias, such as awareness and prevention strategies.

Theme 5. Bone Marrow Transplantation

Mechanisms of Disease

- Define bone marrow, peripheral stem cell, and cord blood transplantation.
- Differentiate between autologous and allogeneic bone marrow transfusion.

Clinical Assessment and Management

- Describe the indications for allogeneic bone marrow transplantation.
- Describe the complications of bone marrow transplantation. Explain the concept of the graft versus leukaemia/lymphoma (GVL) and graft versus host disease (GVHD).

Impact of Disease

- Outline the most frequent diseases that can be treated with autologous bone marrow transplantation.
- Consider the impact of bone marrow transplantation on patient outcomes and healthcare systems.

Theme 6. Anaemias

Mechanisms of Disease

- Compare and contrast various types of anaemias, focusing on their aetiology and natural history, namely:
 - iron deficiency,
 - macrocytic,
 - aplastic,
 - Thalassemia
 - sickle cell disease.
 - Haemolytic anaemia.

Clinical Assessment and Management

- Compare and contrast the clinical presentation of the different anaemias.
- Outline the investigations and treatment modalities for the different forms of anaemia.

Pharmacology and Therapeutics

- Discuss the indications, routes of administration and side effects of the drugs used for the different types of anaemia.
- List common drugs that may cause haemolytic anaemia.

Impact of Disease

- Discuss the epidemiology of thalassemia and its implications for public health programmes such as screening.
- Discuss the role of preventive programmes such as dietary recommendations and supplementation programmes in the prevention of iron deficiency anaemias.

Medical Ethics

- Describe the ethical debate related to public health strategies of mandatory screening of the population to control genetic disorders like thalassemia
- Explain the relevance of morality, culture and history in responses to population genetic screening and testing

Theme 7. Platelet Disorders

Mechanisms of disease

- Define essential thrombocytopenia and thrombocytosis.
- Outline the common causes of thrombocytopenia and thrombocytosis.

Clinical Assessment and Management

- Describe the common clinical presentations of thrombocytopenia and thrombocytosis.
- Describe investigation and management strategies for immune thrombocytopenia.

Pharmacology and Therapeutics

- Discuss the mechanism of action and the indications for drugs affecting platelet function.

Theme 8 Coagulation Disorders

Mechanisms of Disease

- Outline the pathophysiology and natural history of the common disorders of coagulation:
 - Inherited Coagulation Disorders
 - Haemophilia A:
 - Haemophilia B:
 - Von Willebrand Disease:
 - Factor V Leiden Mutation:
 - Prothrombin Gene Mutation (G20210A Mutation):
 - Afibrinogenemia:
 - Acquired Coagulation Disorders
 - Vitamin K Deficiency:
 - Liver Disease:
 - Disseminated Intravascular Coagulation (DIC):
 - Antiphospholipid Syndrome:
 - Medications:
 - Thrombocytopenia

Clinical Assessment and Management

- Outline the common clinical presentations of
 - Haemophilia
 - DIC
 - Heparin induced thrombocytopenia (HIT)
- Describe the laboratory investigations and management of haemophilia, DIC, and HIT.

Pharmacology and Therapeutics

- Describe fibrinolytic treatment and its indications.
- Compare the mechanism of action, half-life and indications of heparin to those of low molecular weight heparin (LMWH), its follow up and complications.
- Describe the mechanism of action and the indications of warfarin treatment, its follow up and complications.
- Name the most important Novel Anti-Coagulants (NOACs) and describe their mechanism of action, indications and contraindications.
- Compare the mechanisms of action, metabolism and elimination of different NOACs.

Theme 8. Transfusion Medicine

- Review the ABO and Rh blood group systems, discuss the genetic basis for transfusion reactions, and outline safety protocols for blood donation and transfusion practices, identifying risks and mitigation strategies.
- Explain the immunological basis of transfusion reactions and ABO blood typing.

Theme 9: Gene therapy

- Describe the example of gene therapy in beta-thalassemia.
- Define gene therapy and outline the different types of methodological approaches.
- Define current applications and limitations of gene therapy.
- Describe the use of stem cells in the treatment of thalassemia.
- Explain whether and how different genetic disorders can be cured by stem cell and tissue engineering approaches.
- Outline how stem cell technology and precision gene therapy can be united to treat genetic diseases.
- Illustrate how targeted treatments can be tailored to the specific mutations causing genetic disease.

Medical Ethics

- Outline key ethical-social aspects of innovative scientific and genetic research
- Consider challenges in genomics and address the ethical boundaries of genetic research
- Outline the ethical implications of stem cell technology
- Explain ethical controversy in gene editing and gene therapy

Infection and Defence

Theme 1. Antimicrobial Resistance and Stewardship

Mechanisms of Disease

- Elucidate the molecular mechanisms underlying the action and resistance of antimicrobials, encompassing the genetic and biochemical pathways that confer microbial resistance.
- Discuss in detail the mechanisms by which antimicrobial agents exert their effects and the molecular and evolutionary bases for the development of resistance to these pharmacological interventions.

Clinical Assessment and Management

- Define and delineate the concepts of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC), and their pivotal role in determining antimicrobial efficacy.
- Provide a detailed outline of the clinical approach to managing a patient with a hospital-acquired infection, emphasizing diagnostic strategies and therapeutic interventions.
- Explain major methodologies employed in susceptibility testing within clinical microbiology laboratories, with emphasis on the interpretation of resistance phenotypes.
- Outline the comprehensive procedural framework for the isolation and identification of infectious agents, integrating advanced diagnostic technologies.
- Detail the laboratory techniques employed for differentiating bacterial species such as Staphylococci and Streptococci, highlighting specific biochemical and molecular assays.

Impact of Disease

- Characterize the predominant resistance phenotypes observed in both gram-negative and gram-positive bacterial isolates encountered routinely in clinical practice.
- Describe the aetiology, epidemiology, and phenotypic characteristics of healthcare-associated infections (HCAI), elucidating the role of multidrug-resistant (MDR) microorganisms.

- Analyse the critical elements of infection control and prevention protocols designed to mitigate the incidence of nosocomial infections.

Medical Ethics

- Discuss ethical and legal considerations in control of infectious and notifiable disease.
- Evaluate doctors' duties and responsibilities in caring for patients with notifiable diseases.

Theme 2. Zoonosis and Vector-borne Infections

Mechanisms of Disease

- Illustrate the biological characteristics, pathogenesis, and clinical manifestations associated with bacterial pathogens such as *Borrelia*, *Leptospira*, *Rickettsia*, *Coxiella*, *Ehrlichia*, and *Anaplasma* spp. Also cover the pathogenic roles of *Yersinia pestis*, *Bartonella* spp., *Pasteurella* spp., *Francisella* spp., *Brucella*, *Bacillus anthracis*, *Erysipelothrix rhusiopathiae*, and *Streptobacillus* spp., as well as vector-borne viruses including Yellow Fever and Dengue virus.

Clinical Assessment and Management

- Provide an in-depth analysis of the clinical progression, diagnostic criteria, and methodologies employed for diagnosing significant zoonotic and vector-borne infections.

Impact of Disease

- Discuss the epidemiological patterns, substantial public health impacts, and prevention strategies for zoonotic and vector-borne diseases, highlighting approaches to minimize disease transmission.

Theme 3. Multisystem Infections Caused by Pleomorphic Gram-Positive Bacteria

Mechanisms of Disease

- Describe the pathogenic mechanisms and disease processes caused by *Nocardia*, *Actinomyces*, *Bacillus*, *Listeria*, and *Corynebacteria* species, and other miscellaneous pleomorphic gram-positive bacteria.

Clinical Assessment and Management

- Discuss the distinct characteristics and clinical presentations of pathogens with multisystem impact.

Impact of Disease

- Analyse the public health ramifications and preventive strategies for infections caused by bacterial and viral pathogens implicated in multisystem syndromes.

Theme 4. Invasive and Systemic Fungal Infections

Mechanisms of Disease

- Describe fungal classification, including taxonomic features and the significance of dimorphic fungi in the pathogenesis of fungal infections.

Clinical Assessment and Diagnostics

- Discuss the major superficial and systemic mycoses, along with contemporary methods for their laboratory diagnosis.
- Classify anti-fungal drugs and describe their mechanisms of action, clinical uses and adverse effects.

Impact of Disease

- Describe predisposing factors that significantly contribute to systemic infections by dimorphic fungi
- Assess the public health implications of invasive and systemic fungal infections, considering morbidity, mortality, and healthcare-associated burdens.
- Discuss strategies for the prevention and control of invasive and systemic fungal infections.

Theme 5. Travel-Associated and Emerging Infections

Mechanisms of Disease

- Explain the fundamental biology and life cycles of travel-associated and emerging pathogens, integrating their epidemiology, clinical presentations, and therapeutic strategies.
- Describe the molecular and cellular pathogenic mechanisms through which parasites interact with and affect their hosts.

Clinical Assessment and Diagnostics

- Address the clinical and pathological manifestations of the most significant parasitic infections, including those caused by helminths, pathogenic amoeba, *Leishmania* spp., *Plasmodium* spp., *Trypanosoma cruzi*, *Trypanosoma brucei*, *Giardia lamblia*, and others.
- Discuss the clinical syndrome presentation of Nipah virus and viral hemorrhagic fevers, such as Ebola, along with other travel-associated and emerging pathogens.
- Provide a concise review of the laboratory methods utilized for diagnosing crucial human parasitic diseases, as well as travel-associated and emerging infectious diseases.
- Classify anti-protozoal and anti-helminthic drugs and describe their mechanisms of action, clinical uses and adverse effects.

Impact of Disease

- Critically analyse and discuss the clinical and public health ramifications of major travel-associated infections, considering their prevention and management strategies.

Theme 6. Immunodeficiency

- Define primary and secondary immunodeficiencies.
- Describe the pathogenesis, clinical outcomes and diagnostic tests of chronic granulomatous disease (CGD).
- Describe the clinical characteristics and pathogenesis of Chediak Higashi syndrome (CHS).
- Describe the pathogenesis, clinical outcomes and diagnostic tests of leukocyte adhesion deficiency (LAD).
- Describe the clinical relevance of the following deficiencies of complement components: alternative pathway component deficiency, classical pathway component deficiency, terminal component deficiency, MBL deficiency.
- Describe the clinical relevance of the following deficiencies: C1INH, DAF and CD59, factor I.
- Describe selective IgA deficiency: pathology and clinical manifestations.
- Describe transient hypogammaglobulinemia of infancy: pathology and clinical symptoms.
- Describe the pathogenesis and clinical features of ataxia telangiectasia, Bruton's X-linked agammaglobulinemia (XLA), X-linked hyper-IgM syndrome and common variable immunodeficiency.
- Outline the pathogenesis, clinical symptoms and diagnostic tests for MHC-I and MHC-II deficiencies.
- Describe the pathogenesis, clinical relevance and diagnosis of Job syndrome, DiGeorge syndrome and Wiscott Aldrich syndrome.
- Describe the pathogenesis, mode of inheritance, clinical relevance and diagnosis of the different forms of SCID (adenosine deaminase deficiency, XSCID, RAG1/2 deficiency).
- Describe the immunology of AIDS.
- Psychology
- Describe the origins of HIV/AIDS.
- Describe the psychological impact of HIV/AIDS.
- Understand the role of HIV/AIDS Counselling.

Epidemiology and Public Health

- List the elements in the chain of infection
- Describe mode of transmission of infectious diseases
- Identify and recommend evidence-based control measures based on mode of transmission
- Explain the public health importance of immunization
- Describe the objectives and types of surveillance systems
- List the key elements of a surveillance system and its attributes.
- Describe surveillance data in terms of time, place and person.
- Outline the steps involved in outbreak investigations
- Describe and interpret the different epidemiological curves
- Describe the organization of infection control systems, including disease reporting and notifiable diseases.

Climate Change and Health

- Assess how climate change can affect risks for zoonotic and vector-borne diseases
- Differentiate between climate mitigation, adaptation, and resilience
- Identify and analyze international, regional, and national actions, such as the Paris Agreement and Intergovernmental Panel on Climate Change responses, to the health impacts of climate change
- Design potential health interventions at the population and individual level to address climate related exposures
- Analyze how healthcare delivery contributes to climate change
- Evaluate strategies for reducing the carbon footprint on health care delivery, from hospitals to outpatient settings
- Examine how climate change can interfere with healthcare delivery, affecting access to care and impacts on health care facilities and supply chains
- Analyze adaptation and mitigation strategies within healthcare systems to address the evolving impacts of climate change
- Develop strategies to build climate resilient health systems
- Promote healthy and sustainable patient behaviors through education, such as plant-based diets and active transportation, highlighting co-benefits
- Demonstrate the ability to communicate climate and health effectively to diverse audiences, including policymakers, professional colleagues, communities, families, and patients

AI & Digital Health

- Understand the impact of digital technology on diagnosing and monitoring of neurological and musculoskeletal and skin diseases.
- Identify digital tools and software used in the assessment and treatment planning of these conditions.
- Discuss the role of wearable and ambient technology in monitoring neuro and musculoskeletal health and function.
- Evaluate the effectiveness of remote-rehabilitation and digital therapy in the management of chronic rheumatic and neurological diseases.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Knowledge

- Explain the scientific principles underlying common and important disease processes including inflammation, infection, neoplasia and trauma.
- Describe basic pharmacological principles together with the pharmacology of commonly used medications, including their modes of action, pharmacokinetics, medication interaction and side effects.
- Describe the role of genetics in predicting the risk of disease and in personalised medicine.
- Explain the determinants of normal human behaviour at an individual and societal level.
- Explain how psychological and sociological factors might impact on the risk of disease and the outcome of treatment.
- Describe how individuals adapt to major life changes, including the onset of illness.
- Describe the role of epidemiology in evaluating the health of a population.
- Discuss the role of environmental, ecological, social, behavioural, occupational and cultural factors in determining health at individual, community and societal levels.
- Describe the principles of primary, secondary and tertiary disease prevention, together with the role of immunisation and screening.
- Describe the basic principles of communicable disease control in both hospital and community settings.
- Discuss the determinants of health from a global perspective and recognise the impact that global factors may have on local health.

(3) SYLLABUS**Musculoskeletal System Themes:**

- Inflammatory arthritis
- Osteoarthritis, crystal arthropathy and metabolic bone diseases
- Autoimmune connective tissue disease and principles of vasculitis
- Infection, autoinflammatory and miscellaneous rheumatic diseases and pain syndromes
- Bone and soft tissue regional pain, trauma, and surgery

Neurology and Mental Health Themes:

- Coma, Trauma and Epilepsy
- Neurodegenerative Disorders
- Stroke and Cerebrovascular disease
- Neuromuscular, Demyelinating and Inflammatory Disorders
- Headache and CNS Infections
- Cranial Nerves and Cerebellar Dysfunction
- An Introduction to Adult Psychopathology
- Adult Mental Disorders
- Child Psychopathology

Skin Themes:

- Inflammatory skin conditions
- Skin infections and infestations
- Neoplastic skin conditions

Haematopoietic System Themes:

- Leukaemias
- Lymphoproliferative Disorders
- Myeloproliferative and Myelodysplastic Disorders
- Plasma Cell Dyscrasias
- Bone Marrow Transplantation
- Anaemias
- Platelet Disorders
- Transfusion Medicine

Infection and defense

- Antimicrobial Resistance and Stewardship
- Zoonosis and Vector-borne Infections
- Multisystem Infections Caused by Pleomorphic Gram-Positive Bacteria
- Invasive and Systemic Fungal Infections
- Travel-Associated and Emerging Infections
- Immunodeficiency

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<i>Use of ICT in teaching / Χρήση ΤΠΕ Communication with students / Επικοινωνία με Φοιτητές</i>	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Yearly Workload
	Lectures/large-group teaching*	154
	Tutorials	56
	Small group work	70
	Directed self-study**	168
	Revision/assessment	70
	Total	518
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	• Final exam (100%)	

(5) ATTACHED BIBLIOGRAPHY

Required Textbooks/Reading:

Authors	Title	Edition	Publisher	Year	ISBN
Medical Microbiology	Medical Microbiology	9th Edition	Elsevier	2021	9780323673228
Clinical Neurology	Clinical Neurology	11th Edition	McGraw Hill/Lange	2020	9781260458350
Oxford Desk Reference: Clinical Genetics and Genomics	Oxford Desk Reference: Clinical Genetics and Genomics	2nd edition	Oxford University press	2017	9780199557509
Kumar and Clark's Clinical Medicine	Kumar and Clark's Clinical Medicine	10th Edition	Elsevier	2021	9780702078682
Kuby Immunology [Including COVID-19 & digital update]	Kuby Immunology [Including COVID-19 & digital update]	8th Edition	WH Freeman	2022	9781319498658
Robbins & Kumar Basic Pathology	Robbins & Kumar Basic Pathology	11th Edition	Elsevier	2023	9780323790185
Rang and Dale's pharmacology	Rang and Dale's pharmacology	10th Edition	Elsevier	2024	9780323873956
Macleod's clinical examination	Macleod's clinical examination	15th Edition	Elsevier	2023	9780323847704
Skills for communicating with patients	Skills for communicating with patients	3rd Edition	CRC Press	2013	9781846193651 https://ebookcentral.proquest.com/lib/nicosia/detail.action?docID=4742673

Recommended Textbooks/Reading:

Authors	Title	Edition	Publisher	Year	ISBN
Dominic Wilkinson, Jonathan Herring, Julian Savulescu	Medical Ethics and Law: A curriculum for the 21st Century	3rd Edition	Elsevier	2020	9780702075964
Ronald Cohn, Stephen	Thompson & Thompson	9th edition	Elsevier	2023	9780323547628

Scherer, Ada Hamosh	Genetics in Medicine				
Hoffbrand, A.V	Hoffbrand's essential haematology	9th Edition	Wiley- Balackwell	2024	9781394168156
by Joseph Loscalzo (Auth or), Anthony S. Fauci (Author), Dennis L. Kasper (Author) , Stephen Hauser (Author) , Dan Longo (Author) , J. Larry Jameson (Auth or)	Harrison's Principles of Internal Medicine, Twenty-First Edition (Vol.1 & Vol.2)	21st Edition	McGraw Hill / Medica	2022	9781264268504
Gillespie and Bamford	Medical Microbiology and Infection at a glance	5th Edition	Wiley- Blackwell	2022	9781119592167
Delves, Martin, Burton and Roitt	Roitt's Essential Immunology	13th Edition	Wiley- Blackwell	2017	9781118415771
Paul Johns	Clinical Neuroscience : an illustrated colour text	1st edition	Elsevier	2014	9781455742127
Impey and Child	Obstetrics and Gynaecology	5th edition	Wiley- Blackwell	2017	9781119010791
DeVita Vincent T, Rosenberg Steven A, Lawrence Theodore S	DeVita, Hellman & Rosenberg's Cancer: Principles and Practice of Oncology	12th edition	Wolters Kluwer Health	2023	9781975184742
Karen J. Marcdante, Robert M. Kliegman, Abigail M. Schuh	Nelson Essentials of Pediatrics	9th edition	Elsevier	2022	9780323775625
Laurence Brunton, Bjorn Knollmann	Goodman & Gilman's The Pharmacologi cal Basis of Therapeutics	14th Edition	McGraw Hill	2023	9781264258079

	Diagnostic and Statistical Manual of Mental Disorders	5th Edition (DSM5)	American Psychiatric Publishing	2022	9780890425763
Krentel A, McKee M	Issues in public health: challenges for the 21st Century	3rd Edition	Open University Press	2022	9780335249152
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