<table>
<tr><td>Course title</td><td colspan="4">Mechanisms of disease and therapeutics III</td></tr>
<tr><td>Course code</td><td colspan="4">MD-401</td></tr>
<tr><td>Course type</td><td colspan="4">Required</td></tr>
<tr><td>Level</td><td colspan="4">1st cycle: undergraduate</td></tr>
<tr><td>Year / Semester</td><td colspan="4">Year 4 / Semester 7 & 8 (Fall and Spring)</td></tr>
<tr><td>Teacher’s name</td><td colspan="4">Theodoros Kyriakides</td></tr>
<tr><td rowspan="2">ECTS</td><td rowspan="2">20</td><td>Large Group Learning per Week</td><td>Tutorials per Week</td><td>Small Group Work per Week</td></tr>
<tr><td>5-6</td><td>2</td><td>2-3</td></tr>
<tr><td>Course purpose and objectives</td><td colspan="4">Musculoskeletal System
1. Discuss the mechanisms of disease related to inflammatory arthritis, osteoarthritis, crystal arthropathy, and metabolic bone diseases, including the pathophysiology, histological features, inflammatory mediators, and genetic associations.
2. Describe the clinical presentation, diagnosis, and differential diagnoses of various forms of arthritis, specifically rheumatoid arthritis, spondyloarthropathies, osteoarthritis, gout, and related conditions.
3. Develop clinical skills for history taking and physical examination in patients with arthritis, as well as proficiency in the use and interpretation of imaging techniques like X-rays, ultrasound, and MRI.
4. Discuss management strategies for rheumatic diseases, including both drug and non-drug therapies, alongside the role of multidisciplinary teams in treatment planning.
5. Explain the pharmacological treatments for inflammatory arthritis, osteoporosis, and related conditions while understanding the mechanisms, side effects, and necessary monitoring for these medications.
6. Discuss the broader impact of disease on public health and economics, including cost-effectiveness of treatments and the global implications of arthritis and related disorders.
7. Describe autoimmune mechanisms, including autoantibody development, classification of autoimmune diseases, and the specific clinical features and management of connective tissue diseases and vasculitis.
8. Discuss the impact of infections and autoinflammatory conditions on rheumatic diseases, along with their clinical features and management strategies.
9. Describe bone and soft tissue injuries, the role of imaging in diagnosis, and the impact of musculoskeletal trauma and surgeries on functionality and quality of life.
Nervous System
10. Define key concepts such as coma, traumatic brain injuries, and seizures, while identifying their potential causes, classifications, and clinical presentations.
11. Differentiate between various neurological conditions, including types of herniation syndromes, movement disorders, and neurodegenerative diseases, understanding their pathophysiology and classification.</td></tr>
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12. Describe the normal anatomy and blood supply of the central nervous system, recognizing common vascular abnormalities and their associated symptoms.
13. Identify clinical signs of conditions such as stroke, TIA, and neuromuscular disorders, while discussing appropriate diagnostic workups and management strategies for these conditions.
14. Explain the implications of space-occupying lesions and the management of headaches and CNS infections, including common methods for diagnosis and treatment.
15. Review the anatomy and pathology of cranial nerves and the cerebellum, demonstrating skills in examining dysfunctions and understanding their treatment approaches.
16. Discuss concepts related to adult psychopathology, including empathy and the diagnosis and treatment of psychological and psychiatric disorders.
17. Describe various adult mental disorders, including anxiety disorders, mood disorders, eating disorders, schizophrenia, substance misuse, and personality disorders, along with their prevalence, aetiology, diagnosis, and treatment strategies.
18. Outline common childhood psychiatric disorders, emphasizing assessment methods, diagnosis, and treatment options for conditions such as autism and ADHD.
19. Discuss psychological therapies and interventions, including the origins, characteristics, and application of psychoanalysis, behavioural therapy, and cognitive behavioural therapy, along with their advantages and disadvantages in clinical practice.

Haematopoietic System

20. Differentiate acute and chronic leukaemia based on key pathophysiological and clinical features and discuss management strategies, prognosis, and public health initiatives for early detection.
21. Define lymphoma and summarize key chromosomal abnormalities, clinical presentations, diagnostic criteria, and the role of PET scans in management.
22. Compare myelodysplastic and myeloproliferative disorders, outlining the mechanisms and management of specific conditions like myelofibrosis and polycythaemia.
23. Explain the pathophysiology and diagnostic criteria for myeloma and discuss associated complications and public health strategies for awareness.
24. Define autologous and allogeneic bone marrow transplantation, discussing indications, complications, and their impact on patient outcomes.
25. Summarize the mechanisms of various anaemias, detailing evaluation and management strategies for different types.
26. Discuss the prognosis and public health strategies for anaemias, focusing on dietary recommendations and screening.
27. Outline thrombocytopenia and essential thrombocythaemia, including diagnostic approaches and management strategies.
28. Review the genetic basis of blood groups and transfusion reactions, emphasizing the importance of safety in blood transfusions and public education on risks.

Infection and defence

29. Comprehend molecular and evolutionary mechanisms of antimicrobial action and resistance.
30. Employ key concepts such as MIC and MBC in determining antimicrobial efficacy and manage hospital-acquired infections effectively.
31. Identify predominant resistance phenotypes and understand the implications for healthcare-associated infections and infection control protocols.

	32. Elucidate the pathogenesis, clinical characteristics, and public health impacts of bacterial and viral zoonotic and vector-borne pathogens. 33. Discuss the pathogenic mechanisms and public health ramifications of infections by pleomorphic gram-positive bacteria. 34. Describe fungal classifications, clinical presentations, and strategies for the prevention and control of fungal infections. 35. Assess the epidemiology, clinical presentations, and treatment of travel-associated and emerging infectious diseases. 36. Explore primary and secondary immunodeficiencies, including their clinical outcomes and diagnostic approaches. 37. Describe the pathogenesis, psychological, and public health aspects of HIV/AIDS, and the importance of counseling and education. 38. Apply epidemiological methods and public health measures to control infectious diseases, emphasizing surveillance and infection control systems.
Learning outcomes	**Musculoskeletal System** **<u>Theme 1: Inflammatory arthritis</u>** ***Mechanisms of disease*** 1. Describe the process of acute inflammation at microscopic and macroscopic level. 2. List the inflammatory mediators involved in inflammatory arthritis. 3. Describe the histology of synovitis as seen in rheumatoid arthritis psoriatic arthritis and crystal arthropathy. 4. Revise the structure and function of bone, cartilage, joints and skeletal muscle. 5. Describe the nature and significance of rheumatoid factor and anti-citrullinated C peptide (Anti-CCP/ACPA) antibodies. 6. Describe the pathophysiology of rheumatoid arthritis 7. Describe the pathophysiology of the spondyloarthropathies 8. Outline the typical plain X ray features of rheumatoid arthritis, psoriatic arthritis and advanced ankylosing spondylitis 9. 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*** 10. Describe the use of ultrasound in the assessment and management of inflammatory arthritis. 11. Describe the role of MRI in the assessment of axial spondyloarthropathy. 12. 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. 13. 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) 14. 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) 15. Discuss the drug and non-drug management of Rheumatoid arthritis

16. 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)
17. 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,dietitian and specialist nurse)
18. discuss the use of ultrasound in rheumatology.
19. Describe the characteristic ultrasound findings of inflammatory arthritis

Pharmacology and therapeutics

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

Impact of disease

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

<u>Theme 2: Osteoarthritis, crystal arthropathy and metabolic bone diseases</u>

Mechanisms of Disease

30. Revise the structure and function of cartilage and bone.
31. Outline urate metabolism from purine intake to excretion.
32. Outline causes of high serum uric acid
33. Describe calcium and vitamin D metabolism including the involvement of intestine, liver and kidney, skin, bone and parathyroid gland.
34. Explain the link between calcium and Vit D metabolism with deficiency of the two.
35. Describe bone turnover, the phases of remodelling and the influencing factors.
36. Explain bone mineralisation and the factors influencing it.
37. Briefly outline congenital and acquired causes of low vitamin D
38. Explain the pathophysiology of the following:
    a. Osteoarthritis

b. Gout
c. Pyrophosphate arthropathy (pseudogout)
d. Osteoporosis
e. Osteomalacia and rickets
f. Rickets
g. Paget's disease of bone

Clinical Assessment and Management

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

Pharmacology and therapeutics

43. Describe the mode of action and use in osteoporosis of the following
44. Bisphosphonates
    a. Anti – RANK ligand monoclonal antibody
    b. Selective oestrogen receptor modulators (SERMs)
    c. Parathyroid Hormone (Teriparatide)
45. 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
46. Describe the rationale for use of bisphosphonates in Paget's disease of bone.

Impact of Disease

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

Research, Epidemiology and Public Health

49. Interpret population pyramids.
50. Discuss the impact of demographic change and population ageing on public health
51. 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

52. Revise the components and function of the immune system
53. Explain the pathophysiology of autoimmunity including the development of autoantibodies and the distinction between pathogenic and non-pathogenic types.
54. Differentiate between organ-specific and non-organ specific autoimmunity with examples.
55. Outline the nature, clinical relevance and methods for detecting Antinuclear antibodies.
56. 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)
57. Describe the nature and significance of anti-dsDNA antibodies including clinical use, sensitivity and specificity.
58. 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.
59. Explain Raynaud phenomenon and differentiate between primary and secondary forms, including causes and disease associations.
60. Classify vasculitis according to size of involved vessels and describe the typical histological findings in temporal arteritis, granulomatous angiitis and microscopic polyangiitis
61. Classify vasculitis in terms of primary and secondary explaining the difference and giving examples of each.
62. Describe what is meant by cANCA, pANCA and anti GBM antibodies.

Clinical Assessment and Management

63. Differentiate systemic lupus from skin lupus
64. Differentiate Systemic sclerosis from localised scleroderma
65. Describe the clinical features (symptoms, signs and criteria for diagnosis) of the following:
    a. Systemic Lupus Erythematosus,
    b. Sjogren syndrome,
    c. Antiphospholipid syndrome,
    d. Systemic sclerosis

e. Polymyositis and dermatomyositis

f. Mixed connective tissue disease

66. Describe the clinical presentation of polymyalgia rheumatica and Temporal arteritis explaining their connection and overlap
67. Briefly describe the clinical features and characteristic organ involvement of Granulomatous angiitis, Churg Strauss syndrome Goodpasture syndrome, microscopic polyangiitis and Henoch Schoenlein purpura
68. List the characteristic antibody associations of:
    a. Systemic Lupus Erythematosus
    b. Sjogren syndrome
    c. Antiphospholipid syndrome
    d. Systemic sclerosis
    e. Mixed connective tissue disease
69. Outline the antibody associations of Granulomatous angiitis and Goodpasture syndrome
70. List the disease associations of cANCA and pANCA
71. Outline the management of systemic lupus erythematosus

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

Mechanisms of Disease

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

Clinical Assessment and Management

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

Pharmacology and Therapeutics

88. Describe the mode of action, uses and side effects of colchicine
89. Describe the use of colchicine in Behcet's disease, familial mediterranean fever, gout and pericarditis

90. Revise the mode of action, side effects and uses of Pregabalin, amitriptyline and duloxetine and outline their use in fibromyalgia.

Impact of Disease

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

<u>Theme 5: Bone and soft tissue regional pain, trauma, and surgery</u>

Mechanisms of disease

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

Clinical Assessment and Management

99. Revise the examination of all parts of the musculoskeletal system (starting with the shoulder, elbow and spine).
100. Describe the components of history taking in a person with a suspected fracture.
101. Describe the classification of fractures in orthopaedics.
102. Describe the management of the various types of fractures.
103. Describe the indications for surgery in fractures.
104. Describe the immediate assessment and management of a patient with major trauma.
105. Describe the indications for joint replacement surgery in rheumatology and orthopaedics
106. Describe the role of arthroscopy in orthopaedics and rheumatology
107. Explain the anatomical nature, clinical features and management of the following:
    a. Rotator cuff syndrome/shoulder tendonitis and subacromial bursitis
    b. Lateral and medial epicondylitis (tennis and golfer's elbow)
    c. De Quervain tenosynovitis
    d. Trochanteric bursitis
    e. Suprapatellar and infrapatellar bursitis.
    f. Morton's neuroma
    g. Tarsal tunnel syndrome
108. Describe the symptoms, clinical assessment and investigation of suspected carpal tunnel syndrome
109. Describe the conservative and surgical management of carpal tunnel syndrome
110. Describe the assessment, with important features in the history and examination of a person with acute or chronic back pain
111. Describe the multidisciplinary management of a person with back pain.

Impact of Disease

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

Psychology

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

Neurology and Mental Health

<u>Theme 1: Coma, Trauma and Epilepsy</u>

Mechanisms of Disease

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

Clinical Assessment and Management

126. Describe the clinical presentation of coma and related conditions.
127. Explain the use of the Glasgow Coma Scale in assessing coma severity.
128. Discuss the process of localizing dysfunction in a patient with coma.
129. Identify brainstem reflexes, posturing, and other reflexes to formulate a differential diagnosis.
130. Outline laboratory investigations for evaluating coma.
131. Differentiate between coma, persistent vegetative state, locked-in syndrome, and brain death.
132. Describe the clinical presentation of seizure disorders and epilepsy.
133. Describe the approach to diagnosing epilepsy, including definitions and further testing (EEG, imaging, etc.)
134. 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.
135. Discuss specific epilepsy syndromes, such as Lennox-Gastaut, Rolandic, and Juvenile myoclonic epilepsy.
136. Demonstrate the initial evaluation and management of head trauma, including raised intracranial pressure.

137. Outline the management of status epilepticus and provide first aid for seizures.
138. Describe the mechanism of action and indication of the main types of anti-seizure drugs and their side effects.
139. Address special considerations, including driving and epilepsy, pregnancy in women with epilepsy, and psychogenic seizures.

Impact of Disease

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

Medical Ethics

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

Theme 2: Neurodegenerative Disorders.

Mechanisms of Disease

145. 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.
146. Discuss the underlying causes of dementia and delirium, focusing on pathophysiological mechanisms.
147. Describe the role of the basal ganglia in motor function and its involvement in neurodegenerative disorders.
148. Explain the classification of movement disorders as hypo- or hyper-kinetic, with examples.
149. Differentiate between idiopathic Parkinson's disease and other Parkinsonian syndromes (e.g., PSP, CBGD, Vascular, MSA) with respect to pathophysiology.
150. Differentiate between types of tremors (resting, action, postural) based on their underlying mechanisms.
151. 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.
152. Explain how expansion of triple repeats cause disease and illustrate this with relevant examples.
153. Define the term genetic anticipation and illustrate with examples.

Clinical Assessment and Management

154. Describe the clinical presentation of dementia and delirium, including key symptoms and signs.
155. Outline the diagnostic approach for dementia and delirium, including common diagnostic tools and criteria.
156. 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.

157. Discuss the clinical presentation and diagnostic approach for infections causing dementia, such as Creutzfeldt-Jakob disease and HIV-related dementia.
158. Outline the principles for management of dementia.
159. Differentiate between idiopathic Parkinson's disease and other Parkinsonian syndromes (e.g., PSP, CBGD, Vascular, MSA) in terms of clinical diagnosis and treatment strategies.
160. Describe the pharmacologic and surgical treatment options for Idiopathic Parkinson's Disease (IPD).
161. 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

162. Discuss the epidemiology of major neurodegenerative diseases, including dementia and Parkinson's disease, focusing on prevalence, incidence, and risk factors.
163. Analyze the public health implications of neurodegenerative disorders, including their impact on healthcare systems and society.
164. Describe the characteristics, challenges, and needs of informal carers who take care of a person with dementia.
165. Outline the stereotypes against older people and explain how older age is presented as a form of social dependency.
166. Describe the advantages of ethnography in understanding the experiences of musculoskeletal conditions

Psychology

167. Outline brain hemispheric asymmetry and hemispheric dominance.
168. Outline the role of neuropsychological testing.
169. Describe the different types of neuropsychological tests used for assessing the functioning of different cortical areas.
170. Outline the role of testing in Neuropsychiatry and Neurorehabilitation.

Medical Ethics and Sociology

171. Describe ethical issues in Huntington's disease, for patients, families, health professionals
172. Outline key ethical and legal issues faced by older people in healthcare, particularly those with limited capacity or dementia.
173. Examine the legal frameworks that protect older individuals from neglect and abuse
174. Analyse the implications of resource allocation, including debates on age-based rationing of care.
175. Explain doctors' ethical requirements and commitments to work with diversity, ensure equity, and tackle stereotypes and discrimination.
176. 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

177. 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.
178. Explain the symptoms associated with disruptions in specific vascular territories of the CNS.
179. Differentiate between types of thrombotic strokes, including cerebral artery occlusion, cerebral infarction, and lacunar strokes.
180. Differentiate between types of embolic strokes, including cerebral embolism and intracerebral hemorrhage, and discuss conditions like subarachnoid hemorrhage and hypertensive encephalopathy.
181. Identify key features of metabolic encephalopathies, such as fluctuating levels of consciousness and asterixis.

Clinical Assessment and Management

182. Recognize the clinical signs of a transient ischemic attack (TIA) and outline the initial assessment approach.
183. Describe the clinical features and anatomical localization of aphasia, apraxia, agnosia, and neglect, providing clinical examples of each.
184. Describe the diagnostic workup for TIA and stroke, including imaging techniques (CT, MRI) and other investigations (echocardiogram, carotid Doppler, and atrial fibrillation assessment).
185. 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

186. Evaluate the public health impact of stroke and cerebrovascular diseases, considering their prevalence and burden on healthcare systems.
187. 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

188. Describe the pathophysiology and clinical presentation of myasthenic syndromes.
189. Classify intrinsic muscle disorders, such as dystrophinopathies and muscular dystrophies.
190. Outline mitochondrial, inflammatory, systemically induced, and toxic myopathies.
191. Recognize and differentiate between radiculopathy, mononeuropathy (including mononeuropathy multiplex), and polyneuropathy.
192. Describe the pathophysiology and common presentations of Multiple Sclerosis (MS) and other demyelinating diseases.
193. Describe acute disseminated encephalomyelitis and its relationship to MS.
194. Discuss leukoencephalopathies, including progressive multifocal leukoencephalopathy (PML), posterior reversible encephalopathy syndrome (PRES), and central pontine myelinolysis.
195. Describe adrenoleukodystrophy and its impact on the nervous system.

196. Outline common immune disorders affecting the nervous system, such as sarcoidosis, diabetes, lupus, antiphospholipid antibody syndrome, and thyroid disease.

Clinical Assessment and Management

197. Explain the utility of various diagnostic tests for neuromuscular disorders.
198. Describe a systematic approach to diagnosing and managing peripheral nerve lesions and dysfunction.
199. Diagnose, evaluate, and treat Amyotrophic Lateral Sclerosis (ALS).
200. 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.
201. 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

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

Medical Ethics

204. 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

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

Clinical Assessment and Management

209. 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.

210. Differentiate between primary headache disorders (e.g., migraine, tension-type, cluster) and describe their clinical presentation.
211. 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.
212. Discuss the diagnostic approach and evaluation of facial pain syndromes.
213. Recognize clues in the epidemiology, clinical presentation, and laboratory findings suggestive of specific causes of meningoencephalitis.
214. Discuss the initial approach to a patient with suspected bacterial meningitis, including the need for brain imaging prior to lumbar puncture.
215. Analyse cerebrospinal fluid (CSF) findings characteristic of different types of meningitis and encephalitis.
216. Explain the consensus case definition of encephalitis and describe the diagnostic approach to a suspected case, including imaging, molecular, and serological investigations.
217. Discuss treatment options for primary and secondary headache disorders.
218. Be familiar with definitive treatment regimens for major pathogens causing acute bacterial meningitis and their possible complications.

Impact of Disease

219. Evaluate the public health implications of CNS infections, including the burden on healthcare systems.
220. Describe the epidemiology of meningitis and encephalitis, focusing on incidence, prevalence, and risk factors.
221. 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

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

Clinical Assessment and Management

227. Localize the site of dysfunction through appropriate examination techniques.
228. Differentiate between monocular and binocular visual loss.
229. Identify the causes of Horner syndrome and other pupillary lesions, such as Adie's and Argyll Robertson pupils.
230. Identify optic disc abnormalities, including papilledema, drusen, optic neuritis, and ischemia, and discuss possible causes.

231. Recognize common cranial nerve lesions and dysfunctions, such as optic neuropathy and oculomotor nerve palsy, including their causes, treatment, and prognosis.
232. Describe the findings in Bell's palsy.
233. Outline and describe the treatment of Ramsay Hunt syndrome, vestibulocochlear lesions and dysfunction, glossopharyngeal neuralgia, and accessory and hypoglossal nerve palsies.
234. Describe the various types of vertigo, their pathophysiology, and treatment.
235. Describe the association and implications of tinnitus, diplopia, dysarthria, and other signs of brainstem dysfunction with vertigo.
236. Describe diagnostic and treatment manoeuvres for vertigo.
237. Describe the signs and symptoms of cerebellar disease.
238. Describe and identify cerebellar haemorrhage and infarction, alcoholic cerebellar degeneration, infectious cerebellitis, and paraneoplastic degeneration.
239. Discuss the various ataxias, including Friedreich ataxia, genetic ataxias, and Miller Fisher syndrome.
240. Identify major gait disorders, including hemiparetic, akinetic rigid, frontal, waddling, proprioceptive, and psychogenic.

Impact of Disease

241. Analyse the public health implications of cranial nerve and cerebellar dysfunctions, including their impact on quality of life and healthcare systems.
242. Discuss the prognosis and long-term outcomes of cranial nerve and cerebellar disorders, including factors that influence recovery and quality of life.
243. Explore prevention strategies for conditions leading to cranial nerve and cerebellar dysfunction, such as lifestyle modifications and early intervention in risk factors.
244. 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.

Empathy and its importance in doctor patient relationships

245. Explain the definitions of cognitive empathy and sympathy and identify the differences between the two.
246. Outline the most up to date research evidence on the impact of empathy on patient outcomes.
247. Outline, based on current research evidence, the changes medical students' empathy undergoes during an undergraduate medical degree.

Psychopathology

248. Describe what is Psychopathology.
249. Outline the methods employed in the diagnosis of psychological and psychiatric disorders.
250. Outline the treatments often used in the treatment of psychiatric and psychological disorders.
251. Outline the most common adult psychological and psychiatric disorders.

Theme 8: Adult Mental Disorders.

Anxiety Disorders.

252. Describe anxiety disorders.
253. Outline the diagnosis of anxiety disorders.
254. Outline the prevalence and aetiology of anxiety disorders.
255. Describe the treatment approaches of anxiety disorders.

Mood Disorders

256. Describe the diagnosis of depression disorders.
257. Outline the prevalence and aetiology of depression.
258. Describe the treatment approaches of depression.
259. Understand causes and interventions on Suicidal Ideation.

Eating Disorders

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

Schizophrenia.

264. Describe Schizophrenia.
265. Outline the diagnostic criteria of Schizophrenia.
266. Describe the prevalence and aetiology of Schizophrenia.
267. Outline the treatment approaches of the disorder.

Substance Misuse

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

Personality Disorders

273. Define personality disorders and outline the main features of common personality disorders.
274. Explain their interaction with other psychiatric disorders, and how co-morbidity can impact on progress and outcome.
275. Describe therapeutic approaches used in treatment of severe personality disorders.

Theme 9: Child Psychopathology.

An Introduction to Child Psychopathology.

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

Autism.

279. Outline the epidemiology and the method of assessment of autism.
280. Describe the diagnosis and treatment of autism.

Attention Deficit Hyperactivity Disorder.

281. Outline the epidemiology and the method of assessment of ADHD/ADD.

282. Describe the diagnosis and treatment of ADHD/ADD.

Learning Disabilities

283. Recognise when a patient has a learning disability and to be aware of the affect that this can have on a person's life.
284. Outline the changing demographics and health needs of this population
285. 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

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

Medical Ethics

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

<u>Theme 10: Psychological Therapies and Interventions.</u>

An Introduction to Psychoanalysis.

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

Learning, Behavioural Therapy and Behaviour Modification.

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

Cognitive Behavioural Therapy.

301. Outline the origins of Cognitive Behavioural Therapy.
302. Outline the main characteristics of the Cognitive Behavioural Therapy.
303. Describe the different techniques employed in the Cognitive Behavioural Therapy Approach.
304. Outline the advantages and disadvantages of the Cognitive Behavioural Therapy Approach in the treatment of Psychological and Psychiatric disorders.
305. Clinical Applications of CBT.

Epidemiology and Public Health

306. Explain the importance of Evidence Based Medicine
307. Apply the PICO approach to search for evidence
308. Outlines the main concepts of systematic reviews and Meta-analysis

309. Explain heterogeneity in evidence synthesis
310. Interpret forest plots
311. Explain publication bias and interpret funnel plots
312. Evaluate the evidence from systematic reviews and meta-analyses
313. Determine the level of evidence and strength of recommendation, and apply it to practice
314. Explain how evidence can influence public health policy
315. Describe the importance of guideline development in the context of public health
316. Critically appraise literature

Climate change and health

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

Medical Ethics

318. Outline definitions, views and models of disability and disability rights, with reference to their ethical implications
319. Define Intellectual Disability (ID) and identify potential barriers ID patients face when trying to access health care services
320. 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

<u>Theme 1: Inflammatory skin conditions</u>

Mechanisms of disease

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

Clinical Assessment and Management

326. Describe the range of clinical presentations and differential diagnoses of acne vulgaris, eczema, psoriasis, dermatitis, rosacea
327. Describe a systematic and logical approach to the investigation and management of acne vulgaris, eczema, psoriasis, dermatitis, rosacea
328. Select appropriate blood tests and other investigations for each of these conditions.
329. Identify lifestyle factors that may contribute to the development and progression of the inflammatory skin conditions.
330. Discuss the role of standardised severity score in the assessment of the severity and impact of the inflammatory skin conditions.
331. Outline the role of non-pharmacological treatments such as light therapy in the management of inflammatory skin disease.
332. Pharmacology and Therapeutics
333. 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

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

<u>Theme 2: Skin infections and infestations</u>

Mechanisms of disease

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

Clinical Assessment and Management

340. 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
341. 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.
342. Select appropriate investigations for each of these conditions.

Pharmacology and Therapeutics

343. 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

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

<u>Theme 3: Neoplastic skin conditions</u>

Mechanisms of disease

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

Clinical Assessment and Management

350. 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
351. 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
352. Explain the role of skin biopsy in the investigation of these lesions.

353. Discuss the indications for staging investigations in skin malignancies and describe the appropriate investigations for staging malignant melanoma and squamous cell carcinoma.
354. 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

355. 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.
356. Discuss the concept and role of immunotherapy in the management of malignant melanoma.
357. 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

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

Psychology

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

Climate Change and Health

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

Medical Ethics

366. Define patient safety and patient safety culture in healthcare
367. Evaluate systemic and human factors and their implications for patient safety.
368. Describe how bias and epistemic injustice contribute to medical errors and patient care issues
369. Describe ethical Implications of technology in healthcare.

Haematopoietic System

<u>Theme 1: Leukaemias</u>

Mechanisms of disease

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

Clinical Assessment and Management

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

Pharmacology and Therapeutics

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

Impact of Disease

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

Theme 2. Lymphoproliferative Disorders

Mechanisms of disease

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

Clinical Assessment and Management

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

Impact of disease

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

Theme 3. Myeloproliferative and Myelodysplastic Disorders

Mechanisms of disease

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

Clinical Assessment and Management

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

Impact of Disease

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

Theme 4. Plasma Cell Dyscrasias

Mechanisms of disease

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

Clinical Assessment and Management

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

Impact of Disease

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

Theme 5. Bone Marrow Transplantation

Mechanisms of Disease

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

Clinical Assessment and Management

402. Describe the indications for allogenic bone marrow transplantation.
403. 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

404. Outline the most frequent diseases that can be treated with autologous bone marrow transplantation.

405. Consider the impact of bone marrow transplantation on patient outcomes and healthcare systems.

Theme 6. Anaemias

Mechanisms of Disease

406. Compare and contrast various types of anaemias, focusing on their aetiology and natural history, namely:
    1. iron deficiency,
    2. macrocytic,
    3. aplastic,
    4. Thalassaemia
    5. sickle cell disease.
    6. Haemolytic anaemia.

Clinical Assessment and Management

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

Pharmacology and Therapeutics

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

Impact of Disease

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

Medical Ethics

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

Theme 7. Platelet Disorders

Mechanisms of disease

415. Define essential thrombocytopenia and thrombocytosis.
416. Outline the common causes of thrombocytopenia and thrombocytosis.

Clinical Assessment and Management

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

Pharmacology and Therapeutics

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

Theme 8 Coagulation Disorders

Mechanisms of Disease

420. Outline the pathophysiology and natural history of the common disorders of coagulation:
    i. Inherited Coagulation Disorders
        1. Haemophilia A:
        2. Haemophilia B:
        3. Von Willebrand Disease:
        4. Factor V Leiden Mutation:
        5. Prothrombin Gene Mutation (G20210A Mutation):
        6. Afibrinogenemia:
    ii. Acquired Coagulation Disorders
        1. Vitamin K Deficiency:
        2. Liver Disease:
        3. Disseminated Intravascular Coagulation (DIC):
        4. Antiphospholipid Syndrome:
        5. Medications:
        6. Thrombocytopenia

Clinical Assessment and Management

421. Outline the common clinical presentations of
    1. Haemophilia
    2. DIC
    3. Heparin induced thrombocytopenia (HIT)
422. Describe the laboratory investigations and management of haemophilia, DIC, and HIT.

Pharmacology and Therapeutics

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

Theme 8. Transfusion Medicine

428. 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.
429. Explain the immunological basis of transfusion reactions and ABO blood typing.

Theme 9: Gene therapy

430. Describe the example of gene therapy in beta-thalassemia.
431. Define gene therapy and outline the different types of methodological approaches.
432. Define current applications and limitations of gene therapy.

433. Describe the use of stem cells in the treament of thalassemia.

434. Explain whether and how different genetic disorders can be cured by stem cell and tissue engineering approaches.

435. Outline how stem cell technology and precision gene therapy can be united to treat genetic diseases.

436. Illustrate how targeted treatments can be tailored to the specific mutations causing genetic disease.

Medical Ethics

437. Outline key ethical-social aspects of innovative scientific and genetic research

438. Consider challenges in genomics and address the ethical boundaries of genetic research

439. Outline the ethical implications of stem cell technology

440. Explain ethical controversy in gene editing and gene therapy

Infection and Defence

<u>Theme 1. Antimicrobial Resistance and Stewardship</u>

Mechanisms of Disease

441. Elucidate the molecular mechanisms underlying the action and resistance of antimicrobials, encompassing the genetic and biochemical pathways that confer microbial resistance.

442. 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

443. Define and delineate the concepts of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC), and their pivotal role in determining antimicrobial efficacy.

444. Provide a detailed outline of the clinical approach to managing a patient with a hospital-acquired infection, emphasizing diagnostic strategies and therapeutic interventions.

445. Explain major methodologies employed in susceptibility testing within clinical microbiology laboratories, with emphasis on the interpretation of resistance phenotypes.

446. Outline the comprehensive procedural framework for the isolation and identification of infectious agents, integrating advanced diagnostic technologies.

447. Detail the laboratory techniques employed for differentiating bacterial species such as Staphylococci and Streptococci, highlighting specific biochemical and molecular assays.

Impact of Disease

448. Characterize the predominant resistance phenotypes observed in both gram-negative and gram-positive bacterial isolates encountered routinely in clinical practice.
449. Describe the aetiology, epidemiology, and phenotypic characteristics of healthcare-associated infections (HCAI), elucidating the role of multidrug-resistant (MDR) microorganisms.
450. Analyse the critical elements of infection control and prevention protocols designed to mitigate the incidence of nosocomial infections.

Medical Ethics

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

Theme 2. Zoonosis and Vector-borne Infections

Mechanisms of Disease

453. 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

454. 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

455. 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

456. 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

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

Impact of Disease

458. 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

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

Clinical Assessment and Diagnostics

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

Impact of Disease

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

Theme 5. Travel-Associated and Emerging Infections

Mechanisms of Disease

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

Clinical Assessment and Diagnostics

467. 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.
468. Discuss the clinical syndrome presentation of Nipah virus and viral hemorrhagic fevers, such as Ebola, along with other travel-associated and emerging pathogens.
469. Provide a concise review of the laboratory methods utilized for diagnosing crucial human parasitic diseases, as well as travel-associated and emerging infectious diseases.
470. Classify anti-protozoal and anti-helminthic drugs and describe their mechanisms of action, clinical uses and adverse effects.

Impact of Disease

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

Theme 6. Immunodeficiency

472. Define primary and secondary immunodeficiencies.
473. Describe the pathogenesis, clinical outcomes and diagnostic tests of chronic granulomatous disease (CGD).
474. Describe the clinical characteristics and pathogenesis of Chediak Higashi syndrome (CHS).
475. Describe the pathogenesis, clinical outcomes and diagnostic tests of leukocyte adhesion deficiency (LAD).
476. Describe the clinical relevance of the following deficiencies of complement components: alternative pathway component deficiency, classical pathway component deficiency, terminal component deficiency, MBL deficiency.

	477. Describe the clinical relevance of the following deficiencies: C1INH, DAF and CD59, factor I. 478. Describe selective IgA deficiency: pathology and clinical manifestations. 479. Describe transient hypogammaglobulinemia of infancy: pathology and clinical symptoms. 480. Describe the pathogenesis and clinical features of ataxia telangiectasia, Bruton's X-linked agammaglobulinemia (XLA), X-linked hyper-IgM syndrome and common variable immunodeficiency. 481. Outline the pathogenesis, clinical symptoms and diagnostic tests for MHC-I and MHC-II deficiencies. 482. Describe the pathogenesis, clinical relevance and diagnosis of Job syndrome, DiGeorge syndrome and Wiscott Aldrich syndrome. 483. Describe the pathogenesis, mode of inheritance, clinical relevance and diagnosis of the different forms of SCID (adenosine deaminase deficiency, XSCID, RAG1/2 deficiency). 484. Describe the immunology of AIDS. *Psychology* 485. Describe the origins of HIV/AIDS. 486. Describe the psychological impact of HIV/AIDS. 487. Understand the role of HIV/AIDS Counselling. *Epidemiology and Public Health* 488. List the elements in the chain of infection 489. Describe mode of transmission of infectious diseases 490. Identify and recommend evidence-based control measures based on mode of transmission 491. Explain the public health importance of immunization 492. Describe the objectives and types of surveillance systems 493. List the key elements of a surveillance system and its attributes. 494. Describe surveillance data in terms of time, place and person. 495. Outline the steps involved in outbreak investigations 496. Describe and interpret the different epidemiological curves 497. Describe the organization of infection control systems, including disease reporting and notifiable diseases. *Climate Change and Health* 498. Assess how climate change can affect risks for zoonotic and vector-borne diseases 499. Differentiate between climate mitigation, adaptation, and resilience 500. 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 501. Design potential health interventions at the population and individual level to address climate related exposures 502. Analyze how healthcare delivery contributes to climate change 503. Evaluate strategies for reducing the carbon footprint on health care delivery, from hospitals to outpatient settings 504. Examine how climate change can interfere with healthcare delivery, affecting access to care and impacts on health care facilities and supply chains 505. Analyze adaptation and mitigation strategies within healthcare systems to address the evolving impacts of climate change

	506. Develop strategies to build climate resilient health systems 507. Promote healthy and sustainable patient behaviors through education, such as plant-based diets and active transportation, highlighting co-benefits 508. Demonstrate the ability to communicate climate and health effectively to diverse audiences, including policymakers, professional colleagues, communities, families, and patients *Digital Healthcare* 509. Understand the impact of digital technology on diagnosing and monitoring of neurological and musculoskeletal and skin diseases. 510. Identify digital tools and software used in the assessment and treatment planning of these conditions. 511. Discuss the role of wearable and ambient technology in monitoring neuro and musculoskeletal health and function. 512. Evaluate the effectiveness of remote-rehabilitation and digital therapy in the management of chronic rheumatic and neurological diseases.		
Prerequisites	None	**Required**	None
Course content	**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 **Haematopoeitic System Themes:**		

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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

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<tr><td>Teaching methodology</td><td>Lectures
Tutorials
Flipped learning
Self-study
Group Work</td></tr>
<tr><td>Bibliography</td><td>Required Textbooks/Reading:
<table>
<tr><th>Authors</th><th>Title</th><th>Edition</th><th>Publisher</th><th>Year</th><th>ISBN</th></tr>
<tr><td>Medical Microbiology</td><td>Medical Microbiology</td><td>9th Edition</td><td>Elsevier</td><td>2021</td><td>9780323673228</td></tr>
<tr><td>Clinical Neurology</td><td>Clinical Neurology</td><td>11th Edition</td><td>McGraw Hill/Lange</td><td>2020</td><td>9781260458350</td></tr>
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Clinical Medicine					
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 Scherer, Ada Hamosh	Thompson & Thompson Genetics in Medicine	9th edition	Elsevier	2023	9780323547628
Hoffbrand, A.V	Hoffbrand's essential haematology	9th Edition	Wiley-Balackwell	2024	9781394168156

	by Joseph Loscalzo (Author), Anthony S. Fauci (Author), Dennis L. Kasper (Author), Stephen Hauser (Author), Dan Longo (Author), J. Larry Jameson (Author)	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 Pharmacological	14th Edition	McGraw Hill	2023	9781264258079

		Basis of Therapeutics				
		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
	Timothy L. Lash, Tyler J. VanderWeele, Sebastien Haneuse, Kenneth J. Rothman	Modern Epidemiology	4th Edition	Wolters Kluwer	2021	9781451193282 https://ebookcentral.proquest.com/lib/nicosia/detail.action?docID=6947080
	Lawrence, Peter	Essentials of General Surgery and Surgical Specialties	6th edition	LWW	2018	9781496351043
	O. James Garden, Rowan W. Parks	Principles and Practice of Surgery	8th Edition	Elsevier	2023	9780702082511
Assessment	Final exam (100%)					
Language	English					