MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
Syllabus for 3 Years B. Sc. (Hons) in Telemedicine and Digital Health
(Effective for Students Admitted in Academic Session 2021-2022)

Semester II

Subject Type		Course Code	Subject	Credit Distribution			Credit	Mode of Delivery	Proposed MOOCs
				L	T	P			
CC	CC3	DHT201	The Human Body as a system: An overview	5	1		6	Offline/ Blended	As per MAKAUT Notification
	CC4	DHT202	Human Diseases and Diagnosis	4			6	Offline/ Blended	
		DHT292	Human Diseases and Diagnosis (P)			2		Offline/ Blended	
GE	GE2		Any one from GE BASKET 1/2/3/4/5	5	1		6	Offline/ Online	
AECC	AECC2	DHT203	Impact of Environment on Health	2			2	Online	
Semester Credits							20		

DETAILED CONTENTS
SECOND SEMESTER

Core Courses

The Human Body as a System: An overview (DHT201)

Full marks: 100
Credit: 5+1=6
Lecture period: 48 hrs

Course Objectives: This course is designed to acquaint students with concept of the human body as a system

COURSE OUTCOMES:

On Completion of the Course, Students will be able to:
CO1: Explain the basics and components of the human body
CO2: Describe the components of various physiological systems
CO3: Identify the scope of assessment of physiological functions
CO4: Enumerate the different feedback cycles in the human body

Contents: (6 Modules, each for 8 hours)

UNIT 1: Introduction to the Human Body and Systems Biology
- Level of Organization of Human Body
- Body planes and Basic examination positions
- Introduction to Systems Biology

UNIT 2:
- Fundamentals of Digestive System (Cells, tissues, organs and functions of the system)
- Fundamentals of Cardio-Vascular System (Cells, tissues, organs and functions of the system)
- Fundamentals of Respiratory System (Cells, tissues, organs and functions of the system)

UNIT 3
- Fundamentals of Integumentary System (Cells, tissues, organs and functions of the system)
- Fundamentals of Musculo-skeletal System (Cells, tissues, organs and functions of the system)
- Fundamentals of Nervous System (Cells, tissues, organs and functions of the system)
- Fundamentals of Endocrine System (Cells, tissues, organs and functions of the system)

UNIT 4
- Fundamentals of Reproductive system (Cells, tissues, organs and functions of the system)

Fundamentals of Lymphatic System (Cells, tissues, organs and functions of the system)
Fundamentals of Urinary System (Cells, tissues, organs and functions of the system)

UNIT 5
Homeostasis and Feedback control systems in the human body
Assessment of physiological functions and dysfunctions
UNIT 6
Overview of various kinds of Medical Imaging
Medical Imaging for Systems Biology

Suggested Reading:

Textbooks:

1. Mogli JD, Paramedics 6-in-1 Handbook, 2nd ed, 2013, Jaypee Brothers
2. Chaudhuri SK, Concise Medical Physiology, 7th ed, 2016, New Central Book Agency (P) Ltd., Kolkata

References:

1. Breitling R. What is systems biology?. *Front Physiol*. 2010;1:9. Published 2010 May 21. doi:10.3389/fphys.2010.00009 Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3059953/
2. ISB, What is Systems Biology: https://isbscience.org/about/what-is-systems-biology/
3. NIH Catalyst: https://irp.nih.gov/catalyst/v19i6/systems-biology-as-defined-by-nih
4. Kherlopian, A.R., Song, T., Duan, Q. *et al.* A review of imaging techniques for systems biology. *BMC Syst Biol* **2,** 74 (2008). https://doi.org/10.1186/1752-0509-2-74
5. Gilad AA, Shapiro MG. Molecular Imaging in Synthetic Biology, and Synthetic Biology in Molecular Imaging. *Mol Imaging Biol*. 2017;19(3):373-378. doi:10.1007/s11307-017-1062-1 Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6058969/
6. Hacker, M., Hicks, R.J. & Beyer, T. Applied Systems Biology—embracing molecular imaging for systemic medicine. *Eur J Nucl Med Mol Imaging* **47,** 2721–2725 (2020). https://doi.org/10.1007/s00259-020-04798-8

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
Syllabus for 3 Years B. Sc. (Hons) in Telemedicine and Digital Health
(Effective for Students Admitted in Academic Session 2021-2022)

Human Diseases & Diagnosis
(DHT202)

Full marks: 100
Credit: 4
Lecture period: 40 hrs

Course Objectives: This course is designed to acquaint students with concept of human diseases and their diagnosis

COURSE OUTCOMES:

On Completion of the Course, Students will be able to:

CO1: Explain the causes and effects of the common human diseases
CO2: Describe the differences between communicable and non-communicable diseases
CO3: Identify the different tests performed for diagnosis of common diseases
CO4: Prepare the patient-centric information on the diagnostic approach to common diseases

Contents:

1. What is history taking and clinical examination?
2. Introduction to Common Diseases and Diagnosis
   Introduction to the common conditions that patients usually present with in India:
   i. Upper Respiratory Tract Infections
   ii. Acute watery diarrhea
   iii. Hypertension
   iv. Pneumonia
   v. Tuberculosis
   vi. Parasitic infestation
   vii. Anaemia
   viii. Diabetes Mellitus
   ix. Backache
   x. Arthritis
   xi. Bronchitis or Bronchiolitis
   xii. Epilepsy
   xiii. Urinary Tract Infection
   xiv. Tonsillitis
3. Basic Concepts on common diseases of the human systems.
4. Causes of the common diseases relevant to India
5. Differences between communicable and non- communicable diseases.
6. Diseases in the community with a public health perspective.
7. Common Diseases of Musculo-skeletal System (Arthritis, Osteoporosis, Bone Fracture etc.)
8. Common Diseases of Urinary System (acute and chronic renal failure, urinary calculi, Nephritis, BPH & Hydronephrosis).
9. Common Diseases of Respiratory System (Asthma, COPD, Acute Respiratory Infections, Pneumonia, Tuberculosis)

10. Common Diseases of Gastrointestinal system (Diarrhea, Hepatitis, Cirrhosis of liver, peptic ulcer disease, indigestion)
11. Common Diseases of Cardiovascular system (Heart Failure, AMI, Rheumatic Heart Disease)
12. Common Diseases of Neurological system (Stroke, Dementia, Parkinson's Disease, Epilepsy)
13. Common Diseases of Endocrine system (Diabetes Mellitus, Thyroid diseases)
14. Common Diseases of Skin (Fungal Infections, Dermatitis, Eczema)
15. Common Mental Diseases (Depression, Anxiety, Bipolar Disorder, Schizophrenia)
16. Common Diseases of Reproductive System (Infertility, Erectile Dysfunction)
17. Common Cancers in India (Cervical, Breast, Lung, Head and Neck, GI and Liver)
18. Why are tests performed for diagnosis of a disease?
19. What are the common materials used for tests ?
    a. Blood
    b. Sputum
    c. Urine
    d. Stool
    e. Body fluids
20. What are the common imaging modalities?
    a. X-ray
    b. Ultrasound
    c. Echocardiography
    d. ECG
    e. CT scan
    f. MRI
    g. PET-CT and other nuclear studies

Suggested Reading:

1) Paramedics-Six in One, Jaypee Brothers
2) Concise Human Physiology by Sujit K. Chaudhuri NCBA 2011
3) Physical Signs Symptoms Diagnosis And Differential Diagnosis In Clinical Medicine by S.N. Chugh CBS 2017
4) Park's textbook of Preventive & Social medicine

Human Diseases & Diagnosis (P)
(DHT292)

Full marks: 100
Credit: 2
Practical Period: 3 hours per week

Course Objectives: This course is designed to acquaint students with practicals of human diseases and their diagnosis

COURSE OUTCOMES:

On Completion of the Course, Students will be able to:

CO1: Comprehend the symptoms, patient present with
CO2: Convey the problems of the patient to the physician
CO3: Record and interpret the investigation reports for onward transmission
CO4: Prepare a summary of the patient with relevant information

List of Investigation Reports:

i) Blood Hematology
ii) Blood Biochemistry
iii) Blood Serology
iv) Urine Routine and Culture
v) Chest Xray
vi) Xray of bones
vii) Ultrasound abdomen
viii) CT Thorax
ix) CT head
x) CT abdomen
xi) MRI Brain
xii) MRI spine

Case Studies (14):

1. A child with cough and wheezing
2. A child with high fever
3. A child with diarrhea
4. A child with jaundice
5. An adult with pain abdomen
6. An adult with persistent cough
7. An adult with weight loss
8. An adult with anaemia
9. An adult with bleeding PR
10. An adult with backache
11. An adult with headache
12. An adult with seizures
13. An adult with loss of consciousness
14. An adult with high blood sugar

Suggested Reading:

1) Paramedics-Six in One, Jaypee Brothers

2) Concise Human Physiology by Sujit K. Chaudhuri NCBA 2011

3) Physical Signs Symptoms Diagnosis And Differential Diagnosis In Clinical Medicine by S.N. Chugh CBS 2017

4) Park's Textbook of Preventive & Social medicine

Impact of Environment on Health
(DHT203)

Full marks: 100
Credit: 2
Lecture period: 20 hrs

Course Objectives: This course is designed to acquaint students with concept of Digital Health and Telemedicine

COURSE OUTCOMES:

On Completion of the Course, Students will be able to:

CO1: Explain the basic concepts of sustainability with environmental pollution
CO2: Describe the components of human-environment interactions
CO3: Identify the scope of inter-linkages between environment and health
CO4: Enumerate the different policies related to sustaining the environment

Contents:

Unit I : Basic Concepts of Environment-Pollution-Sustainability
Environment, Pollution and Contamination - Definition and Scope
Basic Concepts of Hazards, Risks and Disasters
Factors and Spheres of Environment ; Bio-geochemical Cycle
Pollution of Air, Water, Noise, Soil : Types, Causes, Effects
Primary, Secondary and Tertiary Pollutants
Pollution : Source- Pathways-Sink
Indoor Pollution : Role of Aerosols, Refrigerants, CFCs
Environmental Sustainability Goals : Challenges and Prospects

Unit II : Environment - Human Interactions
Population Growth and Impacts on environment
Etiology of diseases
Role of Environmental Carcinogens
Environmental Nanoparticles
Ergonomics & Occupational Health Management

Unit III : Environment - Health Inter-linkages
Understanding Broad Linkages between Environment and Human Health
Climate Forcings - Global warming, Ozone Hole, Acid rain, Atmospheric Brown Clouds, Polar Stratospheric Clouds, PAH, HC, CO and others
Environmental effects of Non-biodegradable materials like Plastics, Burning of Fossil fuels, Automobile Emissions

Heavy Metal Pollution
Manifestations of Climate Change on Public Health: Climate Change Linked Diseases
Industrial and Thermal Pollution on Human Health
Agricultural Pollution (Chemical Pesticide) on Human Health
Water – Sanitation - Hygiene (WASH): Environmental Resilience
Use of isotopes in environmental monitoring

Unit IV : Environment - Policies and Practices
Environmental Legislation
Biomedical and E-Waste Disposal
Solid Waste Management in urban and rural areas: Definition, sources, characterization collection and transportation and disposal methods.
Environmental Ethics and Justice: Socio-Economic Goods and Services
Integrated Environmental Management and Trans-Boundary Cooperation
Need for Integrated Health Systems Research

Suggested Reading:

1. Environmental Science and Sustainability [Daniel J. Sherman and David R. Montgomery, 2020]
2. Health Education and Environmental Studies [Mandeep Singh Nathial, 2020]
3. Environment and Development: Challenges, Policies and Practices [Antonio Augusto and Rossotto Ioris, 2021]
4. Air Pollution: Management Strategies, Environmental Impact and Health Risks [Gerald L. Burns, 2016]
5. How to Avoid Climate Disaster : The Solutions We Have and the Breakthroughs we need [Bill Gates, 2021].