(BM-115) - Physiology-I

Course Outline:

Theory:

1. **Introduction**
    1. The Cell and General Physiology
    2. Functional organization of human body and control of the internal environment
    3. Cell and its function, protein synthesis and cell reproduction
    4. Metabolism of carbohydrates and formation of ATP
    5. Lipid and Protein Metabolism, transport through Cell membrane
2. **Human physiology from a system's view point**
    1. Quantitative issues at the organ and whole body levels of Cardiovascular
    2. Respiratory
    3. Renal
    4. Digestive systems
3. **Nerve and Muscle**
    1. Membrane potential
    2. Action potential
    3. Excitation and Rhythmicity
    4. Contraction of Skeletal and cardiac muscles, sliding filament Mechanism, Heart as a pump
4. **Sensory Systems**
    1. Sensory Receptors
    2. Classification and basic mechanism of action
5. **Somatic Sensations**
    1. Mechanoreceptive sensations, pain, thermal and visceral pain, headache
6. **Special Senses**
    1. Eye, receptor function of the retina, Neurophysiology of Vision, the Chemical Sense-taste and smell

List of Practicals:

1. Use of stethoscope & measurement of human arterial blood pressure & pulse
2. Determination of Red Blood Cells per cmm of human Blood
3. Determination of White Cells per cmm of human blood
4. Determination of haemoglobin percentage in human blood
5. Physiochemical & microscope analysis of human urine sample (Renal System)
6. 1. Demonstration of the use of ECG,
    2. Test of hearing
7. Determination of visual acuity of a human subject by using snellen's eye chart
8. Determination of bleeding time in human body
9. Determination of the coagulation time in human body
10. 1. To record normal respiration & effect of System exercise on it using spirometer.
    2. To record normal respiration & effect of exercise on it using power lab.
11. Introduction the organization & classification of neurons using neurolab
12. To demonstrate the differential count of leukocytes in human blood Sample
13. To observe the shape of RBC in normal saline stem

14. To identify various parts of digestive tract & to observe cut mobility in exposed abdomen of dissected rabbit
15. To determine the group of blood sample

Suggested Teaching Methodology:

- Lecturing
- Written Assignments Report Writing

Suggested Assessment:

Theory (100%)

- Sessional (20%)
- Quiz (12%)
- Assignment (8%)
- Midterm (30%)
- Final Term (50%)

Laboratory (100%)

Text and Reference Books:

1. Physiology for Engineers: Applying Engineering Methods to Physiological Systems (Biosystems & Biorobotics) [Michael Chappell and Stephen Payne], ISBN:978-3319261959
2. Quantitative Human Physiology: An Introduction [Joseph J Feher], ISBN:978-0123821638
3. John E. Hall, Guyton and Hall Textbook of Medical Physiology, 13th Edition, ISBN: 9781455770052
4. Elaine N. Marieb, Essentials of Human Anatomy & Physiology, 11th Edition, ISBN: 9780321919007
5. Arthur B. Ritter, Physiology for Engineers: A Systems Approach, 2017, ISBN: 9781498734561