ZH-GE 1

Course Title: Human Physiology

Total Credits: 02 (Credits: Theory-02, Practical-02)
Total Lectures: Theory- 30 hrs., Practical-60 hrs.

Objectives: This course offers an overview of the concepts of normal biological functions in the human body. The fundamentals of human physiology and histological structures will be correlated. The concept of homeostasis in response to changes in the external environment will be introduced. Further, students will be provided with knowledge that can be applied in everyday life. The students will be encouraged to pursue further studies in physiology and related fields as well as multidisciplinary subjects that require an understanding of the physiology of humans.

Unit I: Tissues **05 hrs**

Types of Tissues; Structure and Function of Epithelial, Connective, Muscular and Nervous tissues.

Unit II: Functioning of Excitable Tissue (Nerve and Muscle) **05 hrs**

Propagation of nerve impulse (myelinated and non-myelinated nerve fibre); Mechanism of muscle contraction (Sliding filament theory).

Unit III: Digestion and Absorption of Food **05 hrs**

Structure and function of digestive system; Digestion and absorption of carbohydrates, fats and proteins.

Unit IV: Respiratory Physiology **04 hrs**

Structure and function of respiratory tract and lungs; Ventilation, External and Internal respiration; Transport of oxygen and carbon dioxide in blood.

Unit V: Cardiovascular System **04 hrs**

Structure of heart, Cardiac cycle, Composition of blood

Unit VI: Renal Physiology **03 hrs**

Functional anatomy of kidney

Unit VII: Reproductive Physiology **04 hrs**

Structure of testis and ovary; Spermatogenesis and Oogenesis.

Practical:

1. Preparation of temporary mount of neurons and blood cells (blood film preparation).
2. Preparation of haemin and haemochromogen crystals.
3. Haemoglobin estimation using Sahli's haemoglobinometer.
4. Determination of ABO Blood group.
5. Recording of blood pressure using a Sphygmomanometer.
6. Examination and detailed study of permanent histological sections of mammalian

Stomach, Duodenum, Liver, Lung, Kidney, Pancreas, Testis and Ovary.

7.

Recommended Books:

1. Tortora, G.J. and Derrickson, B.H. (2012). Principles of Anatomy and Physiology. XIIIth Edition, John Wiley and Sons, Inc.
2. Widmaier E, Raff H and Strang K. (2013). Vander's Human Physiology: The Mechanism of Body Functions. XIIIth Edition, McGraw-Hill Education.
3. Guyton, A.C. and Hall, J.E. (2011) Textbook of Medical Physiology. XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company.
4. Kesar, S. and Vashisht, N. (2007) Experimental Physiology. Heritage Publishers.
5. Prakash, G. (2012) Lab Manual on Blood Analysis and Medical Diagnostics. S. Chand and Company Ltd.

Teaching Learning Process:

Interactive learning using classical lecture mode, PowerPoint Presentations, Discussion, Audio, Visual aids, etc. will be used to personalize lessons, optimize time to create awareness and interest among students.

Learning Outcome:

Upon completion of the course, students will be able to:

- Understand the principles of normal biological function in the human body.
- Outline basic human physiology and correlate it with histological structures.
- Understand the homeostasis in animals in response to changes in their external environment.

Assessment Methods:

The learners/ students can be assessed in the following ways:

- Presenting the topics in the class *via* blackboard teaching/presentations, group discussions etc.
- Lecture units will be assessed by written exams (multiple-choice, short-answer or essay-based).
- Practical units will be assessed by experimental reports and/or short written assignments and/or written exams.
- From time to time, learners will be given practical problems to test their theoretical skills and promote practical knowledge.
- Students would be provided feedback on their work with a view to improving their academic performance.
- Formative feedback throughout the course and summative feedback as mid-semester and semester-end evaluation.