

- b. Development of behavior and impact of neural and physiological mechanisms; role of external and internal stimuli and animal responses. Physiology of behavior in changed environments.
- c. Hormones and behavior in animals.
- d. Innate behavior and innate releasing mechanisms; built in programmed performance by offspring to that of parents. Innate behavior of three spined stickle back fish.
- e. Learned behavior and its mechanisms; quick learners' vs slow learners. Concept of animal cognition; key to understand and develop multiple behavioural choices. Ecological and genetics to maintain animal behavior. Concept of territoriality and defense in animals.
- f. Circadian rhythms and concept of bio-rhythmicity in animals. Maintenance of internal biological clock to perform various diurnal and nocturnal periodicities.
- g. Costs and benefit ratios in behavior; successful foragers and winners of predator-prey relationships. Altruism and parental sacrifice to nurture the young.
- h. Competition for resources; survival of the most suitable individuals; evolutionary arms races in behavior.
- i. Social organization in animals and concept of group living; benefits and losses. Aggression, appeasement and selfish individuals. Social organization in insects and mammals.
- j. Communication in animals: Visual, Bioacoustic, electrical, chemical and tactile.
- k. Various types of chemical signals in animals' behavior and their importance in ecosystems.

Mechanisms in Resting Membrane

Potentials: Electrogenic ion pump. Donnan equilibrium. Ionic mechanisms in action

Potentials: Roles of ion channels. Properties of action potential. Propagation of Action

Potential: Synaptic transmission: Structure and function of electrical synapse & chemical

Synapse: Neurotransmitters: Synaptic receptors: Excitatory postsynaptic potentials:

Inhibitory postsynaptic potentials: Presynaptic inhibitions: Integration at synapses:

Serotonin-specific reuptake inhibitors (SSRIs) Facilitation. Posttetanic Potentiating.

Photoreception: Ultra structure of photoreceptors. Photochemistry, Photo transduction and physiological basis of color vision: Physiological mechanisms in electrophysiology.

Chemical Messenger and Regulators/ Endocrine Physiology: An overview of invertebrate endocrine structures, their hormones and physiological roles. An overview of hormones, their chemistry and physiological roles of Hypothalamus. Leptin effects on hypothalamus and anterior pituitary Pituitary, Thyroid, IGF-I and fetal growth.

Parathyroid and associated structures, Endocrine pancreas, Gastropancreatic system, Adrenal medulla (Chromaffin Tissue), Adrenal cortex, Ovary, Testis and Placenta.

Endocrine functions of kidneys & heart and pineal gland. A generalized model account

of hormone synthesis, storage and secretion (a peptide hormone model and steroid hormones).

Inhibition of glucagon secretion by insulin

Overweight and obesity Fever and neural pathways from liver

General account of hormonal regulations, hormonal turnover, recognition:

Mechanisms of hormonal interactions involving metabolic, developmental, membrane receptors and nuclear modulated gene expression:

The study of Animal Behaviour: Introduction. History of animal Behaviour.

Approaches and Methods. Mechanisms of Behavior: The Nervous System and Behaviour.

Hormones and Behaviour and Learning Behaviour. Finding Food and Shelter:

Migration. Orientation and Navigation.

Books Recommended

1. Vander's Human Physiology with LearnSmart Labs and Connect Access Card 14th Edition
2. Vander, Sherman, Luciano's Human Physiology: The Mechanisms of Body Function 9th Edition by Eric P. Widmaier (Author), Hershel Raff (Author), Kevin T. Strang (Author)
3. Guyton and hall Text book of Medical Physiology 14th. Edition 2020.
4. Pathophysiology of heart disease Leonard S Lilly 2020
5. Memmler's Structure & Function of the Human Body 12th Edition by Barbara Janson Cohen (Author), Kerry L. Hull (Author)
6. Guyton and hall Text book of Medical Physiology 14th. Edition 2020.
7. Pathophysiology of heart disease Leonard S Lilly 2020

8. Memmler's Structure & Function of the Human Body 12th Edition by Barbara Janson Cohen (Author), Kerry L. Hull (Author)

Practicals:

1. Hospital and lab tours to see the actual demonstration of the physiological procedures
2. To work with animals to learn animal handling so that students are prepared for future research requirements and take their physiological measures and check the serological data of hormones etc.

Title: Research Methodology 2(2-0)

Course Objectives:

The course is aims to:

1. Develop research skills Provide understanding how to design scientific research, to collect data and its interpretation
2. Emphasize the importance of ethics in scientific research
3. Enable students to write a research proposal

Course Learning Outcomes:

On completion of this course, the students should be able to:

1. **UNDERSTAND** a general definition of research design.
2. **IDENTIFY** the overall process of designing a research study from its inception to its report.
3. Become **FAMILIAR** with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.
4. **KNOW** the primary characteristics of quantitative research and qualitative research.
5. **IDENTIFY** a research problem stated in a study.
6. Become **FAMILIAR** with how to write a good introduction to an educational research study.
7. To **DISTINGUISH** a purpose statement, a research question or hypothesis, and a research objective.

Course Outline

1. Introduction:

- a. Objectives of Research, Motivations

2. Research Process:

- a. Research methods vs. research methodology, scientific method
- b. Types of research, general steps involved in research
- c. Introduction to Quantitative research, its study design and Data analysis