

UNIVERSITY OF MADRAS
B.Sc. DEGREE COURSE IN PSYCHOLOGY
SYLLABUS WITH EFFECT FROM 2020-2021

BPY-DSC04

CORE-IV: BIOLOGICAL PSYCHOLOGY-II

Instr.Hrs.: 6
Credits : 4

Year : I
Semester: II

Course Learning Outcome

After completion of the Biological Psychology II course, student will be able to:

1. Outline the biological basis of Sleep & Dream and various sleep disorders
2. Explain brain development and neuro plasticity
3. Summarize the brain mechanism involved in regulating thirst, hungry and feeding
4. Relate biopsychology of emotions in relation to stress and ill health
5. Identify the brain areas associated with learning & memory and outline the causes of memory disorders

UNIT I: CIRCADIAN RHYTHMS, SLEEP AND DREAMING

Rhythms of waking and sleeping: Endogenous cycles- Setting and resetting the biological clock- Mechanisms of the biological clock, Sleep and brain mechanisms: Sleep and other interruptions of consciousness, the onset of sleep and hypnagogic hallucinations, stages of sleep. Paradoxical or REM sleep, Brain mechanisms of wakefulness and arousal: Brain functions in REM sleep- Functions of sleep, Dreaming: REM sleep and dreaming. Biological perspectives on dreaming.

UNIT II: BRAIN DEVELOPMENT AND PLASTICITY

Development of the brain- Maturation of the vertebrate brain, Growth and development of neurons -New neurons later in life- Path finding by axons, Determinants of neuronal survival, Neural plasticity: Meaning- Plasticity after brain damage.

UNIT III: BIOLOGICAL BASIS OF THIRST AND HUNGER

Thirst: Mechanisms of water regulation- Osmotic thirst- Hypovolemic thirst and sodium specific hunger, Hunger: Digestion and food selection-Short and long term regulation of feeding-Brain mechanisms - Eating Disorders.

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UNIT IV: BIOLOGICAL BASIS OF EMOTIONS

Emotions: Introduction, Emotions and Autonomic arousal: James-Lange theory, Brain areas associated with emotions- The functions of emotions. Attack and Escape Behaviours: Attack behaviours - Escape - Fear and anxiety- Stress and Health

UNIT V: BIOLOGICAL BASIS OF LEARNING AND MEMORY

Memory: Localized representations of memory- Types of memory- The hippocampus- Theories on the function of the hippocampus- Other types of amnesia: Korsakoff's syndrome, Alzheimer's Disease- The role of the other brain areas.

REFERENCES

1. Carlson, N. R. (2007). *Foundations of Physiological Psychology*, New Delhi, India: Pearson India Education Services Pvt Ltd.
2. Kalat, J.W. (2011). *Biopsychology*, Delhi, India: Cengage Learning India Private Limited.
3. Pinel, J. (2007). *Biopsychology*, New Delhi, India: Pearson India Education Services Pvt Ltd
4. Purves, D., Brannon, E., Huettel, S.A., LaBar, K.S., Platt, M.L., &Woldorff, G.M. (2008). *Principles of cognitive neurosciences*. Sunderland, MA: Sinauer Associates, Inc. Publishers.

WEB RESOURCES

1. <https://www.edx.org/course/ap-psychology-course-2-how-the-brain-works>
2. <https://ocw.mit.edu/courses/brain-and-cognitive-sciences/9-22j-a-clinical-approach-to-the-human-brain-fall-2006/index.htm>
3. www.mooc-list.com/course/neuropsychology-saylororg