



## National University of Sciences and Technology

### Course Description

Course Title	Course Code	Credit Hours
Neural Engineering	BMES-814	3 – 0

#### TEXT BOOK:

- Kandel ER, Principles of neural science, 6<sup>th</sup> edition (latest edition).

#### REFERENCE BOOK

- Neuroprosthetics - Theory and Practice (KW Horch and GS Dhillon, eds), Volume 2 in the Series on Bioengineering and Biomedical Engineering, 2004, World Scientific Publishing, is a suggested reference.
- Dayan, P, Abbott, LF (2001) Theoretical neuroscience, Web version
- Windhorst U, Johansson H (1999) Modern Techniques in Neuroscience Research, 1 Edition. Berlin: Springer
- Koch C, Segev I (1998) Methods

#### COURSE OBJECTIVES:

The primary objective is to survey the current state of design and application of Neuroengineering methods. The nervous system exhibits an extraordinary capability for information processing, storage, and acquisition, much of which emerges from the interactions of systems of neurons. This course will explore cell to systems-level functions and dysfunctions of the nervous system from a scientific and engineering perspective, beginning with issues of sensory coding and motor control, and expanding into issues of homeostasis, arousal, cognitive and mood disorders, and experience-dependent modifications of neuronal operations.

#### COURSE OUTLINES

- Introduction, latest trends, applications
- Microscopic level
- Macroscopic level
- Functional level
- The brain and its functions
- Neural Interfaces
- Brain Stimulation
- Neural Signal Processing
- Neuro feedback
- Recordings of brain signals

#### ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%