

## SEMESTER I

### LSM4213 SYSTEMS NEUROBIOLOGY

**Prerequisite:** LSM3215 and LSM3216

**Workload:** 30 lecture hours + 8 Tutorial hours + 4 Practical Hours + 8 Self-Directed Learning (SDL) hours

The primary goal of this module is to understand (a) how neurons, assembled into circuits, mediate behavior and (b) how technology can remediate neural dysfunction by affecting the circuits. This course draws on basic knowledge of the cell biology and physiology of neurons.

S/N	Topics	Lectures
1.	<b>Sensation and motor behavior</b> Functional neuroanatomy (2hr) General scheme of sensory processing (2hr) Somatosensation and pain (2hr) Basis of vision (2hrs) Organizational features of motor processing (2hr)	10 hr Sanjay Khanna
2.	<b>Higher brain function and synaptic plasticity</b> Object recognition: edge detection and simple forms (2 hr) Object recognition: complex objects, face recognition and beyond (2 hr) Memory (2 hr) Memory and goal directed behaviour (2 hr) Neural basis of working memory (2 hr) Developmental plasticity in vision (2 hr) Plasticity and simple motor learning (4 hr)	16 hr Andrew Tan Fu Yu
3.	<b>Neurotechnology</b> Parkinson's disease and deep brain stimulation (2 hr) Tetraplegia and brain-machine interfaces (2 hr) Practical: muscle-machine interface	4 hr Andrew Tan Wong Boon Seng
		<b>Total Lectures: 30 hrs</b> <b>Tutorials: 8 hrs</b> <b>Practicals: 4 hrs</b> <b>SDLs: 8 hrs</b>
<b>Total hours:</b>		50hrs

**TEXT BOOK:** Bear MF, Connors BW, Paradiso MA, (eds.), Neuroscience: Exploring the Brain, 3<sup>rd</sup> edition

**MODE OF ASSESSMENT:** 45% CA (reports based on SDL), 55% Final Exam

**MODULE CO-ORDINATOR:**

Dr. Tan Yong-Yi, Andrew

(Tel: 6516-5955, E-mail: phstya@nus.edu.sg)

**LECTURERS:**

A/P Sanjay Khanna

(Tel: 6516-3665; E-mail: phsks@nus.edu.sg)

Dr Tan Yong-Yi, Andrew

(Tel: 6516-5955, E-mail: phstya@nus.edu.sg)

Dr Fu Yu

(Tel: 6478-8764, E-mail: fu\_yu@sbic.a-star.edu.sg)

Dr Wong Boon Seng

(Tel: 6772-8283, E-mail: boon\_seng\_wong@nuhs.edu.sg)