

SUBJECT OUTLINE



Subject Name:

Neurophysiology

Subject Code:

MSTN121

SECTION 1 – GENERAL INFORMATION

Award/s:

Bachelor of Health Science (Myotherapy)

Total course credit points:

96

Level:

1st Year

Duration:

1 Semester

Subject Coordinator: Katie Reily (Melbourne campus)

Subject is: Core

Subject Credit Points: 2

Student Workload:

No. timetabled hours per week:

3

No. personal study hours per week:

2

Total hours per week:

5

Delivery Mode:

Face to face

2 hour lecture

1 hour tutorial

Intensive Delivery

Details:

Summer School - contact hours are delivered over five weeks with 2 x 4 hour days delivered per week.

Assessment: Mid-Semester quiz is completed in week 3.

Final written and practical exams are conducted in week 6 of summer school.

Full Time

Part Time

Pre-requisites:

BIOH111

Co-requisites:

Nil

Special Resource Requirements:

1 bath-sheet sized towel per student (Clinic towels must not be used)

Buck reflex hammer

Tuning fork (128 Hz)

Pen torch

SECTION 2 – ACADEMIC DETAILS

Subject Rationale

The aim of this subject is to expand on the students' knowledge and application of neuroscience to the normal and diseased functioning of the human body. The subject has as a prerequisite BIOH111 where the structure and function of the nervous system is introduced. In MSTN121 the students expand their information base in regards to the anatomy and physiology of the nervous system from micro structures within the brain to the macro structures of nerves and their pathways. In addition areas that are important for disease within the nervous system are investigated such as the functional areas of the cerebral cortex, neuroplasticity, the upper and lower motor systems and the brainstem. Students will relate the normal functioning of these areas through analysis to formulate how alterations can and will lead to clinical disorders.

Learning Outcomes

1. Describe the concepts of neuroplasticity.
2. Identify the pathways taken throughout the body by the major nerves and the anatomical structures they are associated with from a clinical perspective.
3. Demonstrate myotomal, dermatomal, cerebellar and neurodynamic examination techniques.
4. Describe the nerve plexi, including muscle and cutaneous innervations.
5. Describe the molecular biology of the synapse and analyse the factors externally and internally that can contribute to alteration in function and how this may contribute to dysfunction.
6. Discuss concepts of nociceptive and neuropathic pain and pain matrix dysfunction.

Assessment Tasks

Type	Learning Outcomes Assessed	Week Content Delivered	Week Due	Weighting
Attendance (80% attendance is required)	N/A	1-13	13	Pass/Fail
Mid-semester Quiz (30 mins)	1,5-6	1-5	6	20%
Practical Exam (30 mins)	3	1-13	Practical Exam Period	30%
Final Written Exam (1.5 hours)	1-6	7-13	Final Exam Period	50%

Prescribed readings:

- Butler, D.S. (2000). *The sensitive nervous system*. Adelaide, SA: Noigroup Publications.
- Lundy-Ekman, L. (2013). *Neuroscience: Fundamentals for rehabilitation* (4th ed.). St Louis, MO: Elsevier.

Recommended readings:

- Beck, R. (2008). *Functional neurology for practitioners of manual medicine* (2nd ed.). Sydney, NSW: Churchill-Livingstone Elsevier.

Subject Content

Week	Topics	Tutorial
1.	Introduction Review of the structure and function of the nervous system Physical and Electrical Properties of Cells in the Nervous System	Practicing diagnostics from neurological evaluation using flow chart and case studies
2.	Synapses and synaptic transmission Synapse physiology Neurotransmitter agonists and antagonists	Introduction to motor and sensory testing procedures
3.	Neuroplasticity Habituation Experience-dependent plasticity Long-term potentiation and depression	Review of motor and sensory testing procedures Introduction to neurodynamic and cerebellar testing
4.	Somatosensory system Sensory receptor types Dermatomes and sensory innervation Sensory pathways	Review of neurological exam testing Introduction to cranial nerve examination
5.	Somatosensation: Clinical applications Lesions of the central and peripheral nervous system Pain physiology and science	Review of neurological examination procedure Introduction to examining cortical sensory function

6.	Mid-semester quiz Neuropathic pain, pain matrix dysfunction, and pain syndromes Chronic pain Neuropathic pain	Review of neurological examination procedure
7.	Autonomic nervous system Role of medulla, pons, hypothalamus, thalamus and limbic system Sympathetic nervous system Parasympathetic nervous system	Review of neurological examination procedure
NON-TEACHING WEEK (note that make-up classes may be scheduled in this week) Semester 1 - This aligns with the week after Easter so it may fall between weeks 6 to 8. Semester 2 - The break week falls between Weeks 7 and 8.		
8.	The motor system Sensory contribution to movement control Motor output Skeletal muscle structure and function Motor neuron tracts Motor neuron lesions	Review of neurological examination procedure
9.	Basal nuclei Nuclei and circuitry Executive, social, behavioral and emotional functions Basal nuclei disorders Cerebellum and movement Anatomy and function of cerebellum Cerebellum disorders	Review of neurological examination procedure
10.	The peripheral nervous system: Upper body Peripheral nerves Cervical Plexus: structure, muscle innervations and cutaneous distribution Brachial Plexus: structure, muscle innervations and cutaneous distribution	Review of neurological examination procedure
11.	The peripheral nervous system: Lower body Lumbar Plexus: structure, muscle innervations and cutaneous distribution Sacral Plexus: structure, muscle innervations and cutaneous distribution	Review of neurological examination procedure
12.	Structure, function and assessment of cranial nerves: Part 1 CN1-7	Review of neurological examination procedure
13.	Structure, function and assessment of cranial nerves: Part 2 CN8-12	Review of neurological examination procedure
14-15.	Non-Teaching/Practical Exam Weeks 1 & 2. Note that make-up classes may be scheduled in these weeks.	
16-17.	Final Exam Weeks 1 & 2 Please refer to the Exam Timetable for your local campus for the exact day and time of exam.	