NS5005: SENSORY AND MOTOR NEUROSCIENCE

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Sensory and Motor Neuroscience

Subject Code
NS - Neuroscience
Course Number
5005

Academic Unit
Neuroscience (NS)

College/School
College of Biomedicine (BD)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil. Very basic undergraduate knowledge of fundamentals of cell biology, physics and neuroscience is assumed.

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
This course aims to give students a very solid foundation in core aspects of neuroscience, namely how nervous systems collect information about their environment through sensory processes, and how they use this information to control

voluntary movements of the body. The course will focus mostly on the mammalian nervous system, but examples from lower vertebrate and invertebrate systems may also be touched upon briefly. There will be a thorough examination of the structure and function of the major senses (vision, hearing, touch, smell, taste, balance) and an introduction to key stations of motor control, from motor units of skeletal muscle all the way to the role of cortex, cerebellum and basal ganglia in action planning and action selection.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Know and understand the key stages of the visual pathway		x	x	x
2	Use an understanding of the visual system to explain visual illusions		x		
3	Know and understand the key stages of the auditory pathway		x		
4	Understand the chemical senses		x	x	x
5	Understand the sense of touch		x	x	x
6	Understand how the nervous system controls muscles		x		

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Delivery of key knowledge	1, 2, 3, 4, 5, 6	2
2	Tutorials	Quizzes and interactive sessions with Q&A to consolidate and deepen understanding of the material delivered in lectures.	1, 2, 3, 4, 5, 6	1

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Through quizzes	1, 2, 3, 4, 5, 6	50	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

Quizzes (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Quiz questions will be designed to test students' knowledge, understanding, and ability to apply the material taught in recent lectures and tutorial demonstrations.

Excellent

(A+, A, A-) Candidate has comprehensive knowledge and deep understanding of the subject matter, as evidenced by very high test scores.

Good

(B+, B, B-) Candidate has good knowledge and understanding of key concepts of neuroscience.

Fair

(C+, C, C-) Candidate has a reasonable amount of knowledge and understanding of key concepts of neuroscience, but there are significant gaps.

Marginal

(D) Candidate has a minimal level of knowledge and understanding of key neuroscience concepts. There are numerous and significant gaps in their understanding, and there is a clear and pressing need for substantial improvement.

Failure

(F) Candidate knows and understands basic concepts of neuroscience, but has substantial gaps.

Assessment Task

Final Exam (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Exam questions will be designed to test students' knowledge, understanding, and ability to apply the material taught in the entire course.

Excellent

(A+, A, A-) Candidate has comprehensive knowledge and deep understanding of the subject matter, as evidenced by very high test scores.

Good

(B+, B, B-) Candidate has good knowledge and understanding of key concepts of neuroscience.

Fair

(C+, C, C-) Candidate has a reasonable amount of knowledge and understanding of key concepts of neuroscience, but there are significant gaps.

Marginal

(D) Candidate has a minimal level of knowledge and understanding of key neuroscience concepts. There are numerous and significant gaps in their understanding, and there is a clear and pressing need for substantial improvement.

Failure

(F) Candidate knows and understands basic concepts of neuroscience, but has substantial gaps.

Assessment Task

Quizzes (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Quiz questions will be designed to test students' knowledge, understanding, and ability to apply the material taught in recent lectures and tutorial demonstrations.

Excellent

(A+, A, A-) Candidate has comprehensive knowledge and deep understanding of the subject matter, as evidenced by very high test scores.

Good

(B+, B) Candidate has good knowledge and understanding of key concepts of neuroscience.

Marginal

(B-, C+, C) Candidate has a reasonable amount of knowledge and understanding of key concepts of neuroscience, but there are significant gaps.

Failure

(F) Candidate knows and understands basic concepts of neuroscience, but has substantial gaps.

Assessment Task

Final Exam (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Exam questions will be designed to test students' knowledge, understanding, and ability to apply the material taught in the entire course.

Excellent

(A+, A, A-) Candidate has comprehensive knowledge and deep understanding of the subject matter, as evidenced by very high test scores.

Good

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Failure

(F) Candidate knows and understands basic concepts of neuroscience, but has substantial gaps.

Part III Other Information

Keyword Syllabus

Vision, Audition, Special Senses, Motor control, Sensory-motor interactions, Multisensory interactions

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Consciousness and the Brain – Stanislas Dehaene
2	Beyond Boundaries – Miguel Nicolelis
3	Selected chapters of "Neuroscience" by Bear, Connors and Paradiso
4	Selected chapters of "Auditory Neuroscience – Making Sense of Sound" by Schnupp, Nelken and King