

NS8106: COGNITIVE AND BEHAVIORAL NEUROSCIENCE

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Cognitive and Behavioral Neuroscience

Subject Code

NS - Neuroscience

Course Number

8106

Academic Unit

Neuroscience (NS)

College/School

College of Biomedicine (BD)

Course Duration

One Semester

Credit Units

3

Level

R8 - Research Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

NS5006

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims at teaching the principles of the mental processes for sensing and storing of information and how it is used to guide human behaviors. The topics include (1) neural activity and perception, sensation, object recognition, language, and attention, (2) basic behaviors such as motor control, motivation (e.g., appetitive drive), decision making and producing proper responses, and (3) higher-level cognitive function such as working memory, emotions, and consciousness. In addition to providing students with general concepts, this course will include practical sessions demonstrating cognitive tests and introductory-level computer modeling. In all topics, special attention will be paid towards their relationship with human health and diseases such as neurodevelopmental and neurodegenerative disorders.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	To understand the biological concepts that are relevant to all major types of human cognitive functions, and their roles in affecting human behaviors.	40	x	x	
2	To understand the mechanism, development and possible disruptions to the neural circuits that regulate the human cognitive functions and behaviors.	30	x	x	x
3	To understand the pathology and pathogenesis of human diseases typically carrying defects in cognitive functions and/or behavioral abnormality.	30	x	x	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	Teach the theoretical concepts of each selected topic.	1, 2, 3	
2	Tutorials	Review papers and book chapters in written essays, and oral presentation in one selected topic.	1, 2, 3	

3	Practical labs	Further illustration of the human mental processes through computer modeling, genetic manipulation, neuroimaging and electroencephalography.	1, 2, 3	
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Practical labs	1, 2, 3	10	-	No
2	Midterm	1, 2, 3	20	-	No

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Assessment Rubrics (AR)**Assessment Task**

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

Criterion

Can understand the concepts simulated in the computational modelling, and relate to the biological mechanisms as discussed in the lectures.

Excellent

(A+, A, A-) Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good

(B+, B, B-) Substantial performance on all CILOS. Evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair

(C+, C, C-) Average level of performance on all CILOS. Some evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; some evidence of familiarity with literature.

Marginal

(D) Unsatisfactory performance on a number of CILOS. Failure to meet specified assessment requirements; little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Failure

(F) Unsatisfactory performance on all CILOS. Failure to meet specified assessment requirements in the exams; no evidence of familiarity with the subject matter; weakness in critical and analytic skills; irrelevant use of literature.

Assessment Task

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

Criterion

Can memorize basic terminologies. Can analyse, state and apply the principles and subject matter learnt in the course.

Excellent

(A+, A, A-) Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good

(B+, B, B-) Substantial performance on all CILOS. Evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Fair

(C+, C, C-) Average level of performance on all CILOS. Some evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; some evidence of familiarity with literature.

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Failure

(F) Unsatisfactory performance on all CILOS. Failure to meet specified assessment requirements in the exams; no evidence of familiarity with the subject matter; weakness in critical and analytic skills; irrelevant use of literature.

Assessment Task

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

Criterion

Can memorize basic terminologies. Can analyse, state and apply the principles and subject matter learnt in the course.

Excellent

(A+, A, A-) Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good

(B+, B, B-) Substantial performance on all CILOS. Evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

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Failure

(F) Unsatisfactory performance on all CILOS. Failure to meet specified assessment requirements in the exams; no evidence of familiarity with the subject matter; weakness in critical and analytic skills; irrelevant use of literature.

Assessment Task

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

Criterion

Can understand the concepts simulated in the computational modelling, and relate to the biological mechanisms as discussed in the lectures.

Excellent

(A+, A, A-) Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

Good

(B+, B) Substantial performance on all CILOS. Evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

Marginal

(B-, C+, C) Unsatisfactory performance on a number of CILOS. Failure to meet specified assessment requirements; little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited or irrelevant use of literature.

Failure

(F) Unsatisfactory performance on all CILOS. Failure to meet specified assessment requirements in the exams; no evidence of familiarity with the subject matter; weakness in critical and analytic skills; irrelevant use of literature.

Assessment Task

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

Criterion

Can memorize basic terminologies. Can analyse, state and apply the principles and subject matter learnt in the course.

Excellent

(A+, A, A-) Outstanding performance on all CILOs. Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base.

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(B+, B) Substantial performance on all CILOS. Evidence of grasp of subject; some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature.

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Assessment Task

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

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Part III Other Information

Keyword Syllabus

Sensation, Perception, Object recognition, Attention, Memory, Motor, Emotion, Human behavior and psychology, Neurodevelopmental disorder, Neurodegenerative disorder

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	"Cognitive Neuroscience: The Biology of the Mind"; by Michael Gazzaniga, Richard B Ivry, George R Mangun; 5th edition; W. W. Norton & Company, 2018"
2	" Neuroscience "; by Dale Purves, George J. Augustine, David Fitzpatrick, William C. Hall, Anthony-Samuel LaMantia Richard D. Mooney, Michael L. Platt, Leonard E. White; 6th edition; Sinauer Associates is an imprint of Oxford University Press, 2017