

**City University of Hong Kong**  
**Course Syllabus**

**offered by Department of Neuroscience**  
**with effect from Semester A 2023/2024**

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**Part I Course Overview**

<b>Course Title:</b>	Neurobiology of Disease
<b>Course Code:</b>	NS5002
<b>Course Duration:</b>	One semester
<b>Credit Units:</b>	3
<b>Level:</b>	P5
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	Nil
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	Nil
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

## Part II Course Details

### 1. Abstract

The aim of this course is to provide student with an understanding of pathophysiology and therapy for a wide spectrum of neurological and psychiatric disorders. The primary focus of this course will be on degenerative disorders (e.g. Parkinson), acute injury (e.g. stroke); neurodevelopmental disorders (e.g. Autism) and neuropsychiatric disorders (e.g. Schizophrenia, depression). For each disease discussed, the section will be organized to introduce fundamental aspects of nervous system dysfunction, molecular mechanisms underlying disease pathogenesis, current treatments, and on-going translational research for therapeutic invention. The class format will be a mix of lecture-based sessions and discussions of scientific articles. The topics will be addressed through scientific, literary and popular media in a combination of lectures and tutorials. There will be many opportunities for interactive group work and sharing of ideas during the classes. With these approaches, students will gain an understanding of disease presentation and current knowledge gap as well as preclinical models for investigating pathogenesis and developing new drug of human brain disorders.

### 2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No	CILOs <sup>#</sup>	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Obtain a working knowledge of anatomy and physiology of the central nervous system.	15	✓		
2.	Understand the symptoms, signs and basic principles of major traumatic, neurodegenerative, neurodevelopmental disorders of the nervous system.	20	✓	✓	
3.	Able to know experimental models for investigating neurological disorders. Able to know the updated molecular mechanisms underlying pathogenesis of multiple neurological disorders.	20	✓	✓	✓
4.	Ability to present, interpret, and critically analyze preclinical studies of human disease reported in the scientific literatures.	15		✓	✓
5.	Understand the basic principles and modalities of current treatments for multiple brain disorders. Gain ability to explain the utility and limitations of animal models for developing effective therapies for neurological disorders.	20		✓	✓
6	Identify knowledge gaps in our current understanding of biological mechanisms and treatment strategies for brain disorders.	10		✓	✓
		100%			

\* If weighting is assigned to CILOs, they should add up to 100%.

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 self-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.

### 3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3	4	5	6	
Lectures & Tutorials	Learning and interactive discussion based on a combination of lectures and models to introduce brain structure and function, pathogenesis of brain disorders and current and future treatments.	✓	✓	✓	✓	✓	✓	
Class discussion	Interactive discussions on scientific topics, preclinical studies in the scientific literatures and knowledge gaps will promote broader perspectives and a deeper critical understanding of the complex connections between issues of profound importance.				✓	✓	✓	
Group presentation/projects	Projects based task will be assayed to small groups by means of writing an essay or ppt presentation to demonstrate the creative, collaborative, and communication skills.			✓	✓	✓	✓	

### 4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3	4	5	6		
Continuous Assessment: <u>70</u> %								
Quizzes after lectures			✓	✓	✓		25%	
Projects based poster/platform Presentation or writing essay				✓		✓	25%	
Class discussion, assignments, and attendance	✓	✓	✓	✓	✓	✓	20	
Examination: <u>30</u> % (duration: 2 hours)								

\* The weightings should add up to 100%.

100%

## 5. Assessment Rubrics

*(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)*

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Quizzes	Correction	>75% of corrected questions.	>60 to 74% of corrected questions	45% to 59% of corrected questions	Do not hand in the assignment on time, or correctly answered < 40% of the questions.
2. Projects based poster/platform group presentation or writing essay	The content, literature review and logic of the essay (75%). The session of questions and answer (25%) .	Demonstrates a high level of knowledge and integration regarding content, literatures, and issues. Provide clear answers with detailed explanations for questions.	Demonstrates a well-developed knowledge regarding content, literatures, and proposed topics. Provide clear answers for questions.	Demonstrates basic knowledge regarding content, literatures, and proposed topics. Provide answers partially for questions.	Lack ability to demonstrate the content, literatures, and proposed topics without logic and details.
3. Class discussion, assignments, and attendance	To be able to define the scientific concept and principles clearly and logical with integration. Able to discuss current limitations, advanced therapeutic platforms and ethical concerns with critical thinking. Raise up good questions will add additional mark.	Demonstrates a high level of understanding for the content with substantial integration. Develops deep thinking for discussed issues.	Demonstrates understanding of the content and develops deep thinking for discussed issues.	Demonstrate a basic content. The discussed issues are easy to understand but lacking of details	Do not submit the essay or not involved in any discussion.  The content is poorly written.
4. Final Examination	Correction of answers and able to describe key points of scientific based issues.	>75% of corrected questions.  Clearly define and describe all key points for the issues.	>60 to 74% of corrected questions.  Describe majority of key points for the issues.	45% to 59% of corrected questions.  Describe a few key points for issues.	Not reaching marginal levels.

## Part III Other Information (more details can be provided separately in the teaching plan)

### 1. Keyword Syllabus

*(An indication of the key topics of the course.)*

	Course Topics	Lectures
1.	Introduction	Course introduction & overview of neurological disorders
		Formation and functional diversity of the nervous system.
2.	Neurodegenerative disorders	Parkinson's disease
		Alzheimer's disease
		Multiple Sclerosis
		Huntington's disease
3.	Traumatic injury induced neurological disorders	Traumatic brain injury
		Spinal cord injury
		Pain
4.	Neurodevelopmental disorders	Genetic etiology for the neurological diseases
		Disorders of intellectual, learning and speaking (Autism, Attention deficit hyperactive disorder, Dyslexia)
		Disorders of motor coordination (Cerebral palsy, Dyspraxia and SMA)
5.	Neuropsychiatric disorders	Schizophrenia and Bipolar disorder
		Obsessive Compulsion and addictive Disorder
6.	Group based project	Poster or topical presentations

### 2. Reading List

#### 2.1 Compulsory Readings

*(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)*

1.	We set no compulsory textbooks for the course.
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#### 2.2 Additional Readings

*(Additional references for students to learn to expand their knowledge about the subject.)*

1.	"Cutting edge" recent publications, and review articles
2.	Diseases of the Nervous System, 2nd Edition - May 18, 2021, Harald Sontheimer eBook ISBN: 9780128213964