

BISC 423, Spring 2025

From Epilepsy to Ecstasy: Biological Basis of Neurological Disorders

General Information: T-Th; 12:30pm – 1:50pm
RRI 101

Instructor: Michael W. Quick
mquick@usc.edu
DML 234
1-7023
Personal Zoom ID: 944 989 7925
Office Hours: Anytime-- just email me

Credit: This is a 4-unit course that includes lectures, clinical correlations, and real clinical cases in which you will be asked to perform clinical assessments, generate differential diagnoses, and create treatment plans as a way to better understand the basic biology of nervous system disorders.

Purpose: The recent explosion of research in the field of neuroscience has produced an increasingly thorough understanding, at multiple levels of description from the molecular to the behavioral, of many of the major disorders of the nervous system that have clinical ramifications. These disorders span the range of neurobiological inquiry from development (e.g. spina bifida, cerebral palsy) to signaling (e.g., myasthenia gravis, epilepsy, multiple sclerosis), to anatomical systems (e.g., stroke, tumors, multiple sclerosis), to combinations of fields (e.g., schizophrenia, Alzheimer's disease, amyotrophic lateral sclerosis). Thus, these disorders will serve as entry points for students, especially those interested in careers in health care, to learn the basic principles of nervous system function at the molecular, cellular and systems level.

Pre-Requisites: BISC 421, permission of instructor.

Approach and Course Structure: I attach a rough draft of a syllabus that outlines the course. Briefly, the course is divided into various modules: introduction to clinical medicine, neural development, head & circulation, neuroanatomy, neural systems, cytology & signaling, and higher brain function. Each module has a similar format. Out of class you will have readings and lectures to review. In class we will reinforce this information using real clinical cases, demonstrations, and Q&A.

Grading: There are three components to the final grade:

25% is class participation

25% is a weekly diary of your efforts outside of class

50% is a set of projects that are part of a national effort to better understand the role that AI will play in current and future pre-health and health professions education. You, in partnership with AI, will be:

1. Creating a patient with cognitive deficits
2. Testing your patient using cognitive tests
3. Creating a patient with neurological deficits
4. Performing and H&P and neurological exam on your patient
5. Reviewing neuroanatomy
6. Creating a differential diagnosis from given symptoms and signs
7. Detailing the clinical background and biological basis of a given disease
8. Creating a detailed clinical note on that disease

Text: There is no mandatory text. Handouts will be provided. Access to general neuroscience textbooks will be useful.

Important Dates:

14 January	First day of class
31 January	Project 1 due
14 February	Project 2 due
28 February	Project 3 due
14 March	Project 4 due
18, 20 March	Spring break
04 April	Project 5 due
18 April	Project 6 due
01 May	Last day of class
14 May	Project 7, project 8, and weekly diary due

Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
<https://sites.usc.edu/clientservices/>

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Class Schedule

Module I: Introduction to Course and to Clinical Medicine

Week: 1, 2
(5 clinical cases)

Module II: Disorders of Development

Week: 2, 3
(5 clinical cases)

Module III: Disorders of Cranium and Circulation

Week: 4
(9 clinical cases)

Module IV: Gross Anatomy

Week: 5, 6, 7, 8
(8 clinical cases)

Module V: Disorders of Autonomic, Hypothalamic, Motor, and Special Sensory Systems

Week: 8, 9, 10
(14 clinical cases)

Spring Break (18 Mar)

Spring Break (20 Mar)

Module VI: Disorders of Transmitters and Synapses

Week: 10, 11, 12
(10 clinical cases)

Module VII: Disorders of Cortex

Week: 12, 13
(8 clinical cases)

Module VIII: Review and End of Semester

Week: 13, 14, 15
(5 clinical cases)