

COURSE TITLE: CLINICAL NEUROBIOLOGY

COURSE CATALOG CODE AND SECTION NUMBER: 01:146:447

SEMESTER: FALL

COURSE INSTRUCTOR AND CONTACT INFORMATION

Course Director: Martin Grumet, PhD mgrumet@dls.rutgers.edu

Course Faculty: David Margolis, PhD david.margolis@rutgers.edu

COURSE MEETING DAYS, TIMES, LOCATION, MODALITY

This course will be taught in person on Tues. & Thurs. 2:00 –3:20 PM; Tillet 226, Livingston Campus.

Tuesdays 5:30 PM – 6:30 PM and Thursdays 3:50 PM – 4:50 PM.

OFFICE HOURS / STUDENT SUPPORT HOURS

Student support hours are scheduled for Tuesdays 5:30 PM – 6:30 PM and Thursdays 3:50 PM – 4:50 PM. Questions about lectures and course materials will be discussed in these sessions, which will take place in Nelson D251 Keck Conference room on Busch Campus. Students with personal issues are encouraged to make an appointment to meet with Professors; walk-ins are encouraged and will be accommodated whenever possible. Students who are concerned about a specific exam should write or make an appointment to the Professor no later than 1 week after the exam.

COURSE DESCRIPTION

This course focuses on development and function of the central nervous system with an emphasis on diseases and disorders. It has 4 modules: 1) CNS Development, Stem cells and Disease; 2) Neurological Disorders and Stem cells; 3) Neurodegenerative Diseases; and 4). Retinal function and degeneration, and Phantom limb pain.

Classes will focus on:

- Development of the nervous systems and the role of stem cells.
- CNS disorders and diseases including demyelination, Amyotrophic Lateral Sclerosis, Parkinson's Disease, Alzheimer's Disease, Huntington's Disease, and cancer.

- Zika and COVID19 Viral infections.
- Spinal cord injury and neurotrauma, and treatments with cells and exosomes.
- Retinal degeneration and Phantom limb pain

This course typically has ~50-100 students. Lectures will include breaks to allow for questions. Class participation is highly encouraged but will not be part of the final grade. The course is divided into four modules. The first three will be taught by Dr. Martin Grumet and the fourth by Dr. David Margolis. The weights of the exams are based on the numbers of lectures in each module and there are more lectures in the first and last modules. The first exam will cover 7 lectures and is worth 28% of your grade, the second and third exams will each have 5 lectures worth 20%, and the final has 8 lectures and is worth 32% of your grade.

REQUIRED TEXTS AND COURSE MATERIALS

There is no text for the course. Lecture notes will be posted on Canvas before class. These slides are considered homework and should be reviewed by students before class. Suggested texts for background are Essential Cell Biology 6th Edition by Bruce Alberts, ISBN 9781324033394, and Neuroscience 6th Edition by Dale Purves, ISBN-13: 978-1605353807 (chapters 1, 22 and 26). These texts have been used for Fundamentals of Cell and Developmental Biology, and Fundamentals of Neuroscience, respectively, and they serve as reference and foundational information for this course. You are expected to be familiar with the materials covered in these courses. All course materials are copyrighted by the University and the individual instructors. Unauthorized distribution of these materials could violate the University Academic Integrity Policy and may subject you to disciplinary action.

Exams: There will be four exams with a review session before each one. You should bring **one** computer or other electronic device only for the purpose of taking the exam on Canvas with **Lockdown Browser**. Phones or other electronic devices are not allowed during exams: your phones should be placed on a desk in front of the class. You will **not** have access to course slides, or your own lecture notes during the exam. There will be ~35 questions on each exam. Exams will consist mostly of multiple-choice questions with several T/F. The first exam will be worth 28% of your grade, the second and third exams will each be worth 20%, and the final 32%, which is based on the number of lectures in each module 7, 5, 5, and 8, respectively. Exams may include diagrams. Class time is devoted for review before each exam. Please communicate with Professors about expected absences (e.g. medical school interviews) as soon as possible **prior** to the exam. Absences on exam days that are not excused satisfactorily

prior to the exam may lose up to ten points on a make-up exam, and non-emergency absences may lose the opportunity to take a makeup. Makeups are highly discouraged and will only be given in the next class time following the exam. You need to arrange in advance for a makeup with justification such as a medical school interview. Please inform the Professors ASAP if you have a conflict or a health issue.

Lockdown Browser will be used for exams. Please download and familiarize yourself with this app. It is **your responsibility** to get this browser working on your laptop. We will run one or more tests prior to the first class to ensure the browser works for you. Please make sure that you know how to use Canvas with **Lockdown Browser** so that you will be able to take exams. If you need help, contact Professor Martin Grumet ASAP **before** the first class.

Quizzes: There will be five quizzes for which you need to use Lockdown browser. The first will be on 9/1/26 the first day of class and will be worth 1 point for extra credit towards the first exam. In addition, there will be one quiz for each of the four modules credited to the corresponding test. The subject of the quizzes will be the lecture given that day. Three 1-point questions will be given in each of the four module quizzes; 2 for credit added to the 98 points on each exam. (98 possible exam points +2 points maximum from the quiz; $98+2=100$). The other 1-point question for extra credit will be added to your exam score in the same module. Scores exceeding 100, will be valued at 100. Quizzes can only be taken in class and there are **no makeups or excuses** for any reason.

Instructions for Exams

1) Bring a fully charged functioning laptop or ipad-like device along with your charger just in case. You can **use only one electronic device. No smart phones.** All phones will be placed in front of the class during the exam.

2) You will only access the Canvas exam through **Lockdown Browser**, which will require a code ONLY provided in the classroom or under supervision of an approved proctor. There are no remote exams.

3) We will provide blank scrap paper during the exam, so bring your pens/pencils but no papers of your own.

4) Access to class notes and outside websites during the exam is not permitted. If for **any** reason your computer exits the exam, report every incident immediately to the Professor. Questions that are answered during these lapses (gaps) in your exam log may receive no credit if they are not reported to the Professor during the exam.

TECHNICAL / TECHNOLOGY REQUIREMENTS

Students are invited to visit Rutgers Student Tech Guide website for resources:

<https://it.rutgers.edu/technology-guide/students/#new-brunswick>

If you do not have the appropriate technology for financial reasons, please email the

Dean of Students at deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid:
<https://financialaid.rutgers.edu/>.

LEARNING GOALS

Course and Department Learning Goals

The learning goals for this course are consistent with general goals set by the Department of Cell Biology and Neuroscience, as well as the Division of Life Sciences. They include:

- Master factual and conceptual knowledge in neurodevelopment, neurotrauma, nervous system disorders and cell transplantation that will provide a solid foundation for success in advanced training and professional careers.
- Develop an ability to summarize, integrate and organize complex information.
- Develop an ability to use scientific reasoning to evaluate the potential for current research and new discoveries to improve your understanding of how to treat nervous system functions and disorders and its relevance to human health and to our society.

GRADING SCALE

A 90.00-100%

B+ 85.00-89.99%

B 80.00-84.99%

C+ 75.00-79.99%

C 67.00-74.99%

D 60.00-66.99%

F <60.00%

The cutoffs for the grades may be lowered if the final average for the class is below 85. Warning grades will be issued if a student has a failing grade after the first exam.

ASSESSMENT / GRADING COMPONENTS

The course is divided into 4 modules and there will be four 80-minute exams. The first three exams will be given in class on the date scheduled for the course, and the fourth on a date that will be determined. Exams will consist mostly of multiple-choice questions and several T/F. There will usually be ~35 questions on exams. The first exam will be worth 28% of your grade, the second and third grades will each be worth 20%, and the final 32%. In preparation for exams, students should study the slides, which serve as the lecture notes. The exams may include diagrams. Class time is devoted to review before each exam in the last lecture before the exam.

POLICIES

Attendance and Participation

Attendance is expected and encouraged for all classes. Students who don't attend lectures may miss class discussions and questions/answers during discussions in class. Students who do not attend class may miss some information that could compromise their exam scores. Students are expected to take exams on time, failure to do so could result in deductions of points. For best success in the course, we urge regular attendance in class.

If you anticipate not being able to take an exam, you must report absences in advance using the University self-reporting absence system: <https://sims.rutgers.edu/ssra/> and notify the course director Dr. Martin Grumet in writing prior to the exam. When you self-report an absence, an email is automatically sent to the course director. You may be able to take a make-up exam with a documented absence indicating the reason for your absence. If you fail to contact Dr. Grumet by email of a missed exam within 2 days after the exam date you may be denied the opportunity to take a makeup and/or may lose points off your grade. Medical or other emergencies may be valid exceptions. If you anticipate missing an exam because of an interview or other important matter, you must write to Dr. Grumet **in advance** of the exam.

You should be familiar with Rutgers policy on attendance and cancellation of classes: <https://sasundergrad.rutgers.edu/degree-requirements/policies/attendance-and-cancellation-of-classes>. Students who have a prolonged health and/or financial issues that are impacting their academics and well-being over an extended period of time should contact the Dean of Students at deanofstudents@echo.rutgers.edu. The Dean of Students may provide the instructor with a letter requesting flexibility.

Disability and Other Accommodations

Students in need of disability accommodations should register for accommodations and consult the policies and procedures of the Office of Disability Services website:

<https://ods.rutgers.edu>

To receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus in a timely manner where you will be officially enrolled, participate in an intake interview, and provide documentation. Make sure that Professor Grumet is aware of your accommodation.

For other accommodations please consult:

- Academic Calendar: <https://scheduling.rutgers.edu/scheduling/academic-calendar>
- Rosters (with Absence and Warning information): <https://sims.rutgers.edu/rosters>
- Final Exam Scheduling: <https://scheduling.rutgers.edu/scheduling/exam-scheduling>
- Interfaith Calendar: <https://www.interfaith-calendar.org>

ACADEMIC INTEGRITY POLICY

You should be familiar with the University website on Academic Integrity:

<http://nbacademicintegrity.rutgers.edu/>

In taking this course you agree to sign:

On my honor, I have neither received nor given any unauthorized assistance on any examination or assignment.

Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations will be reported to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- Cheating
- Plagiarism
- Aiding others in committing a violation or allowing others to use your work
- Failure to cite sources correctly
- Fabrication
- Using another person's ideas or words without attribution, including re-using a previous assignment unauthorized collaboration
- Sabotaging another student's work

If you are ever in doubt, consult your instructor.

STUDENT SUPPORT AND MENTAL WELLNESS

- Student Success Essentials: <https://success.rutgers.edu>
- Student Support Services: <https://www.rutgers.edu/academics/student-support>
- The Learning Centers: <https://rlc.rutgers.edu/>
- Rutgers Libraries: <https://www.libraries.rutgers.edu/>
- Bias Incident Reporting: <https://studentaffairs.rutgers.edu/bias-incident-reporting>
- Dean of Students – Student Support Office:
<https://success.rutgers.edu/resource/dean-students-student-support-office>
- Office of Veteran and Military Programs and Services:
<https://veterans.rutgers.edu>
- Student Health Services: <http://health.rutgers.edu/>
- Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS): <http://health.rutgers.edu/medical-counseling-services/counseling/>
- Office for Violence Prevention and Victim Assistance: www.vpva.rutgers.edu/
- Office of Disability Services: <https://ods.rutgers.edu/>
- Basic Needs Assistance (food, housing, and other essentials): <https://ruoffcampus.rutgers.edu/basic-needs>
- Rutgers Student Food Pantry: <https://ruoffcampus.rutgers.edu/food-pantry>
- UWill: <http://health.rutgers.edu/uwill/>
- Rutgers Student Food Pantry: <https://ruoffcampus.rutgers.edu/food-pantry>

LockDown Browser Requirement

This course requires the use of LockDown Browser for online exams. Watch this video to get a basic understanding of LockDown Browser:

<https://www.respondus.com/products/lockdown-browser/student-movie.shtml>

A LockDown Exam in Canvas uses Respondus LockDown Browser to prevent students from accessing other apps, websites, or files during a test.

LockDown Browser locks the screen into Canvas and Blocks:

- Copy/paste
- Opening other tabs/apps
- Screen capture & printing

Download and install LockDown Browser on your computer from this link:

- <https://download.respondus.com/lockdown/download.php?id=762943427>

Once Installed

- Quit all browsers (Safari, Chrome ...)
- Open LockDown Browser **from Applications folder**
- Log into Canvas
- Navigate to the exam

Note: You won't be able to access an exam that requires LockDown Browser with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue. If you have difficulty launching the exam, talk to the professor ASAP.

Getting Help

Several resources are available if you encounter problems with LockDown Browser:

- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area
- Respondus has a Knowledge Base available from support.respondus.com. Select "LockDown Browser" as the product to view helpful articles.
- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it.
- Alternatively, if you need help contact OIT at 833-646-4357.

			Clinical Neurobiology (CN) Fall 2026
			Tues/Th 2:00-3:20 PM
CN F26	Professor	Date	Tillet 226, Livingston Campus
	Grumet		Module 1: CNS Development, Stem cells & Virus
1.1	Grumet	1-Sep	Course Introduction & Intro to NSC
1.2	Grumet	3-Sep	Early Development & Neural Cells
		8-Sep	NO CLASS
1.3	Grumet	10-Sep	Glymphatic System
1.4	Grumet	15-Sep	Neural Stem Cells, Lineage and Induced Cells
1.5	Grumet	17-Sep	CNS & Neuronal Development
1.6	Grumet	22-Sep	Effects of Zika and Covid on the CNS
1.7	Grumet	24-Sep	Neural Organoids & Zika, and Review for Exam 1
	Grumet		Exam 1
	Grumet	29-Sep	Module 2: Neurological Disorders and Stem cells
2.1	Grumet	1-Oct	Intracellular Transport in Normal Neurons & Disease
2.2	Grumet	6-Oct	Brain Tumors: Glioblastoma and Medulloblastoma
2.3	Grumet	8-Oct	Stem cells and Spinal Cord Injury
2.4	Grumet	13-Oct	Immunological Basis of Myelin Disorders
2.5	Grumet	15-Oct	Optic neuritis & MSC exosomes, and Review for Mod 2
	Grumet	20-Oct	Exam 2
	Grumet		Module 3: Neurodegenerative Diseases
3.1	Grumet	22-Oct	ALS is a Neurodegenerative Disease
3.2	Grumet	27-Oct	ALS Mutant Genes C9ORF72 and TDP-43
3.3	Grumet	29-Oct	Alzheimer's Disease
3.4	Grumet	3-Nov	Parkinson's Disease and stem cells
3.5	Grumet	5-Nov	Huntington's Disease, and Review for Mod 3
	Grumet	10-Nov	Exam 3
	Margolis		Module 4: Retinal degeneration & Phantom limb pain
4.1	Margolis	12-Nov	Retinal circuitry
4.2	Margolis	17-Nov	Retinal degeneration
4.3	Margolis	19-Nov	The experience of blindness
4.4	Margolis	24-Nov	Strategies for restoring vision
4.5	Margolis	26-Nov	Somatosensory circuitry
		1-Dec	Thanksgiving, No Class
4.6	Margolis	3-Dec	Circuit plasticity mechanisms
4.7	Margolis	8-Dec	The experience of phantom pain
4.8	Margolis	10-Nov	Treatment of chronic pain.
		16-Dec	Final Exam. 12:00 PM-3:00 PM