

**COURSE NAME; NUMBER; SEMESTER; MEETING DAYS, TIMES, AND PLACE.**

Neuroendocrinology (3 cr)

16:340:510, Fall 2020

T45, Tuesday @ 2:15–5:15 PM

Zoom meeting (link information will be emailed to the registered students)

**CONTACT INFORMATION:**

Instructor: Dipak K. Sarkar

Phone: 609-651-1023

Email: [dipak.sarkar@rutgers.edu](mailto:dipak.sarkar@rutgers.edu)

Office Hours: Thursdays @ 2:00–3:00 PM

**COURSE WEBSITE, RESOURCES, AND MATERIALS:**

- The course materials (“Neuroendocrinology” text by D.K. Sarkar, Case Studies, and Hot Topics) will be emailed to the registered students.
- For additional reading material, it is recommended to use *An Introduction to Neuroendocrinology* (2<sup>nd</sup> edition) by Michael Wilkinson and Richard E. Brown.

**COURSE DESCRIPTION:**

The course provides comprehensive and up-to-date coverage of the interrelationships between the central nervous system and the endocrine system in the mammal. The course also provides the student with basic concepts and experimental approaches in mammalian neuroendocrinology, including cellular and molecular actions of hypothalamic and pituitary hormones and the role of these hormones in controlling reproductive functions, body metabolism (e.g., obesity and diabetes), stress, growth, biological rhythms, drug addiction, and immunity. It also provides the opportunity for the student to learn how to critically interpret information from the neuroendocrinology literature. It is expected that students in the class have a solid background in biology and in physiological processes. **Note:** This course is cross-listed with *Neuroendocrinology* 11:067:410.

Minimum technology requirements

For this course, it is recommended that you meet the technical requirements below.

- A computer (desktop/laptop) or mobile device (smartphone/tablet) that is less than five years old.
- Speakers/headphones/earbuds for listening to audio or videos.
- Webcam for interacting in course activities (Zoom).
- A stable Internet connection. A speed at or above 25 Mbps is recommended for smooth video stream and conferencing.

**ASSIGNMENTS/RESPONSIBILITIES, GRADING, AND ASSESSMENT:**

- Two take-home examinations (a midterm and a final), each consisting of 30 points each, will be given on the topics discussed in the lectures. These exams will be formatted as short-essay and problem-solving questions. Exams will be letter-graded.
- Each graduate student will be required to make two research presentations (a hot topic and a research article; 20 points each). Each presentation will be a 40-minute seminar describing research findings in a particular neuroendocrine research area.

Research presentations should be formatted as follows:

- a. Clear statement of the research problem (introduction of the area of research)
- b. Hypotheses being tested
- c. Methods applied to test the hypotheses
- d. Results

- e. Conclusions
- f. Critique and future direction

The quality of the presentations will be graded on the following:

- a. Speaks clearly
- b. Good use of visual aid
- c. Answering questions

### ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Please follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full policies and procedures are at <https://ods.rutgers.edu/>

### ABSENCE POLICY

Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

### COURSE SCHEDULE (Subject to change):

#### COURSE SCHEDULE (Subject to change):

September 1	<b>Lecture #1: Principles of cellular neuroendocrinology</b> (class objectives) <b>Techniques in neuroendocrine research</b> (part 1 by Dr. Velan Murugan) <b>Techniques in neuroendocrine research</b> (part 2 by Dr. Omkaram Gangisetty)
September 15	<b>Lecture #2: Hypothalamus</b> (didactic lecture) Model case study presentation (case 1 by Dr. Benedicte Rousseau) Model research presentation (Dr. Sayani Mukherjee; FEBS Let 2017; 591:1742–1751).
September 22	<b>Lecture #3: Pituitary gland</b> (didactic lecture) Case study presentations (cases 2 & 3) Hot topic presentation (topic 1) Research presentation 1 (Am J Physiol Endocrinol Metab. 2019 Jun 1;316(6):E1036-E1049 )
September 29	<b>Lecture #4: Sexual differentiation of the neuroendocrine brain</b> (didactic lect.) Case study presentations (cases 4 & 6) Hot topic presentation (topic 2) Research presentation 2 ( <i>Endocrinology</i> 2012, 153:1936)
October 6	<b>Lecture #5: Neuroendocrine control of gonadotropin release</b> (didactic lecture) Case study presentation (case 9) Hot topic presentation (topic 3) Research presentations 3 & 4 ( <i>Proc Natl Acad Sci</i> 2014, 111:10335 & <i>Reprod Biol Endocrinol.</i> 2017; 15(1):46)
October 13	<b>Lecture #6: Neuroendocrine control of prolactin release</b> (didactic lecture) Case study presentation (cases 10 & 11) Hot topic presentation 4 (topic 4) Research presentation 5 ( <i>Stem Cells Dev</i> 2012, 21:3245 or <i>Lab Invest.</i> 2000, 80:239-47)
October 20	<b>Lecture #7: Neuroendocrine control of thyroid hormone release</b> (didactic lecture) Case study presentation (case 14) Hot topic presentation (topic 5) Research presentations 6 & 7 ( <i>Nature</i> 2012, 491:66-71 & <i>Endocrinology</i> 2009 May;150(5):2283-91)
October 20	<b>Take-home midterm exam given out; due on October 27</b>
October 27	<b>Lecture #8: Neuroendocrine control of growth hormone release</b> (didactic lect) Case study presentation (case 18) Hot topic presentation (topic 6) Research presentations 8 & 9 ( <i>Proc Natl Acad Sci</i> 2006, 103:6031 &

November 3	<i>Proc Natl Acad Sci</i> 2013, 110:E4619-27 ) <b>Lecture #9: Hypothalamic control of food intake</b> (didactic lecture) Case study presentation (case 19) Hot topic presentation (topics 7, 8 & 9) Research presentation 10 ( <i>Sci Rep.</i> 2016 Nov 30;6:37992)
November 10	<b>Lecture #10: Neuroendocrine control of stress axis function</b> (didactic lecture) Case study presentation (case 22) Hot topic presentation (topic 10) Research presentations 11 & 12 ( <i>Neuropsychopharmacology</i> 2000, 22:219 & <i>Neuropsychopharmacology</i> 2016 Oct; 41(11): 2782–2793)
November 17	<b>Lecture #11: Neuroendocrine-immune interaction</b> (didactic lecture) Case study presentation (cases 26 & 27) Hot topic presentation (topic 11) Research presentation 13 ( <i>Cancer Prev Res (Phila).</i> 2015;8:56-67)
November 24	<b>Lecture #12: Neuroendocrine control of biological rhythms</b> (didactic lecture) Case study presentation (cases 28 & 29) Hot topic presentation (topics 12 & 13) Research presentation 14 ( <i>Proc Natl Acad Sci</i> 2008, 105:15593-8)
December 1	<b>Lecture #13: Obesity, hypothalamus, and bone</b> (didactic lecture) Case study presentation (cases 30 & 31) Hot topic presentation (topics 15 & 17) Research presentation 15 ( <i>Bone.</i> 2018 Oct;115:31-42)
December 8	<b>Grant preparation practice (optional)/Reading day</b>
December 8	<b>Take-home final exam given out; due on December 15</b>

## FINAL EXAM DATE AND TIME

**Take-home final exam given out on December 8, 2020; due on December 15**

## ACADEMIC INTEGRITY

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academic-integrity-policy>. The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

### **STUDENT WELLNESS SERVICES**

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

#### **Counseling, ADAP & Psychiatric Services (CAPS)**

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901 / [www.rhscaps.rutgers.edu/](http://www.rhscaps.rutgers.edu/)

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

#### **Violence Prevention & Victim Assistance (VPVA)**

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / [www.vpva.rutgers.edu/](http://www.vpva.rutgers.edu/)

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling, and advocacy for victims of sexual and relationship violence and stalking to students, staff, and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

#### **Disability Services**

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the registration form on the ODS website at: <https://ods.rutgers.edu/students/registration-form>.

#### **Scarlet Listeners**

(732) 247-5555 / <https://rutgers.campuslabs.com/engage/organization/scarletlisteners>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.