

# Nobel Prizewinners in Neuroscience

## GMS7795/PSB6930 Syllabus Fall 2016

### PLEASE READ CAREFULLY

Welcome to this graduate special topics course on Nobel Prizewinners in Neuroscience. This is a 1-credit course and runs for the first 6 weeks of the Fall semester 2016. The course will present biographies and select publications of past winners of a Nobel Prize that can be categorized as encompassing brain function or behavior. This serves as an historical perspective for considering major advances in this field over the past century. To date, there have been almost 50 recipients of the annual Nobel prize in Medicine/Physiology whose award was for research in or relevant to brain sciences. Brain science is not the field of the award each year, but when it is there are usually two or more winners. I have organized award winners into 5 thematic categories. In each category there are 4-5 occasions of award, presented chronologically, although they are not necessarily linked other than by the theme.

#### Scientific categories/Modules:

- **Category/module 1: Basic structure & function of neurons (29 Aug-4 Sept)**
  - 1906 (Golgi & Cajal)  
"in recognition of their work on the structure of the nervous system"
  - 1932 (Adrian & Sherrington);  
"for their discoveries regarding the functions of neurons"
  - 1963 (Eccles, Hodgkin & Huxley);  
"for their discoveries concerning the ionic mechanisms involved in excitation and inhibition in the peripheral and central portions of the nerve cell membrane"
  - 1986 (Cohen & Levi-Montalcini).  
"for their discoveries of growth factors"
  
- **Category/module 2: Chemical transmission between neurons (5 -11 Sept)**
  - 1936 (Dale & Loewi);  
"for their discoveries relating to chemical transmission of nerve impulses"
  - 1970 (Axelrod, Katz & van Euler);  
"for their discoveries concerning the humoral transmitters in the nerve terminals and the mechanism for their storage, release and inactivation"
  - 1977 (Guillemin & Schally);  
"for their discoveries concerning the peptide hormone production of the brain"
  - 2000 (Carlsson, Greengard & Kandel);  
"for their discoveries concerning signal transduction in the nervous system"
  
- **Category/module 3: Sensory systems (12-18 Sept)**
  - 1961 (von Bekesy);  
"for his discoveries of the physical mechanism of stimulation within the cochlea"
  - 1967 (Granit, Hartline & Wald);

- "for their discoveries concerning the primary physiological and chemical visual processes in the eye"
    - 1981 (Hubel & Wiesel);  
"for their discoveries concerning information processing in the visual system"
    - 2004 (Buck & Axel).  
"for their discoveries of odorant receptors and the organization of the olfactory system"
- **Category/module 4: Evolution and behavior (19-25 Sept)**
  - 1904 (Pavlov);  
"in recognition of his work on the physiology of digestion, through which knowledge on vital aspects of the subject has been transformed and enlarged"
  - 1949 (Moniz & Hess);  
"for his discovery of the therapeutic value of leucotomy in certain psychoses" and "for his discovery of the functional organization of the interbrain as a coordinator of the activities of the internal organs"
  - 1973 (Lorenz, Tinbergen & von Frisch);  
"for their discoveries concerning organization and elicitation of individual and social behaviour patterns"
  - 1981 (Sperry);  
"for his discoveries concerning the functional specialization of the cerebral hemispheres"
  - 2014 (O'Keefe, Moser & Moser).  
"for their discoveries of cells that constitute a positioning system in the brain"
- **Category/module 5: Technical/technological advances (26 Sept – 2 Oct)**
  - 1979 (Cormack & Hounsfield);  
"for the development of computer assisted tomography"
  - 1986 (Neher & Sakmann);  
"for their discoveries concerning the function of single ion channels in cells"
  - 2003 (Lauterbur & Mansfield);  
"for their discoveries concerning magnetic resonance imaging"
  - 2013 (Rothman, Schekman & Sudhof).  
"for their discoveries of machinery regulating vesicle traffic, a major transport system in our cells"

Instructor: Dr. Neil Rowland. You can reach me through the Canvas e-mail, or [nrowland@ufl.edu](mailto:nrowland@ufl.edu). I really want to hear from you, and normally I will respond to your questions within 24 hours.

Format: This is a fully on-line course, using the Canvas shell. The course is divided into 5 modules, which are programmed in a week-by-week sequence. Within each module, you are expected to pace yourself to complete the week's assignments. You must keep up – you have to complete one module before you will be able to access the next. This also means that you must have a reasonably fast computer and reliable internet access. If you have computing problems, call the UF help desk (352-392-HELP). If you have additional questions about the CANVAS platform, please see the [Canvas Student Guide](#)

Learning objectives and evaluation: Each of the course modules has a set of learning objectives that describe the specific inventions or advancements of the historical figures of the week, and ends with a short self-check quiz to assess your grasp of the material. Each module has an essay assignment in which you are asked to describe how the prizewinning findings are having a sustained impact in modern (last 5 years) neuroscience/behavior. The key idea here is that you get used to writing a short paper each week, and that it is a topic that teaches both you and me something about personalities and the flow of ideas and discovery in these aspects of science.

Course materials and topics: The course materials are entirely on-line and consist of biographies, videos, and published papers of the winners. Each module lasts one week and normally will be available at 8 a.m. Mondays of each week. Each module essay is due by 11:59 p.m. on Sunday of that week and is worth up to 20 points graded from a rubric.

Each week on Monday, after you submit your paper, will be assigned a paper for peer review (5 points). These should be critical reviews of the interest and quality of the essay, especially how it was linked to the field today, and are due 11:59 p.m. Tuesday. A model grading rubric will be provided.

The materials for the next module will not be released until you have submitted a paper for the previous module, but will not be dependent on the peer reviews being completed. After you have submitted your last peer reviews (#5), the class will be completed (no cumulative/final exam).

The total points for the class are as follows:

Module papers (5 @ 20 points) = 80 points

Peer reviews (5 @ 10 points) = 20 points

Grading scale: % A 92% – 100% A -90% – 91% B + 87% – 89% B 83% – 86% B -81% – 82% C + 78% – 81% C 74% – 77% C -71% – 73% D + 68% – 70% D 64% – 67% D - 60% – 63% E (Fail) < 60%

#### Additional information, Links and Policies

1. Computer/internet access to Canvas is required for this course. Students are responsible for maintaining access to Canvas.
  - Extensions will not be given for student-based technical difficulties. Do not wait until the last minute to complete assignments and quizzes!
  - If UF Canvas experiences technical difficulties, deadlines will be adjusted to allow for completion of assignments.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Class attendance: This is a fully on-line course but students will be required to complete each module in the week assigned. Justifiable delays (e.g., professional travel) must be explained to the instructor and any assignment(s) missed made up on a mutually agreed upon timetable.

Accommodations: Students with disabilities who request accommodations must first register with the Disability Resource Center 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) and provide documentation to the instructor.

Plagiarism: UF students are bound by The Honor Pledge which states “We, the members of the University of Florida community pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have never given nor received unauthorized aid in doing this assignment". The Honor Code <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel.

Grade points: The letter grades assigned as above will translate into grade points according to UF policy: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Course evaluation: At the end of the semester in which the course is offered, students will be prompted (by the relevant University office) to provide on-line feedback on the quality of instruction <https://evaluations.ufl.edu>. Results can be viewed <https://evaluations.ufl.edu/results2>. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

3. Academic Honesty. This course uses the definitions and guidelines for academic honesty as described by the Dean of Students Office. See <http://www.dso.ufl.edu/judicial/academic.php> for details. As a general rule, for plagiarism or cheating I assign a 0 for that assignment. If it is a severe offense, the penalty may be more severe and paperwork will be filled out so that this is documented on your record. To be blunt, DO NOT plagiarize or cheat.

4. Getting Help: For issues with technical difficulties with Canvas, please contact the UF Help Desk at: [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu) or (352) 392-HELP - select option 2 or their website at <https://lss.at.ufl.edu/help.shtml>. \*\* Any requests for extensions due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up. Other resources are available at <http://www.distance.ufl.edu/getting-help> for: Counseling and Wellness resources, Disability resources, Resources for handling student concerns and complaints and the Library Help Desk support. Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

6. Religious Observances. Please check your calendars against the course due dates. Any student having a conflict due to religious observance should contact me as soon as possible so that we can make any necessary arrangements.

7. Copyright Statement Some of the materials in this course are possibly copyrighted. They are intended for use only by students registered and enrolled in this course and for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act.