

# Adv Topics in Psychobiology [830:410]

## History of Neuroscience



*A word from the first known medical text of mankind, the so-called "Edwin Smith Surgical Papyrus", probably first written by the Egyptian surgeon called Imhotep (1700 BC) and based upon now lost texts from ~3000 BC*

Spring 2015  
Allison Road Classroom Bldg. Room 206  
Tues/Thurs 5:00-6:20pm

Instructor: Dr. Kasia Bieszcza  
*Office: Psychology Building Room 227*  
*Email: [kasia.bie@rutgers.edu](mailto:kasia.bie@rutgers.edu) Class email: [neurohistory@sakai.rutgers.edu](mailto:neurohistory@sakai.rutgers.edu)*

Office Hours: Friday afternoons by appointment

Grading: You will receive a letter grade (worth your 3 credits) based upon in-class participation (this includes attendance!) and evaluations (e.g., pop-quizzes and peer-evaluations), blog entries (one per week), one midterm, and a term paper that you will share with the rest of your class in a 20-25 minute Powerpoint-type presentation. *There will be no final exam to worry about.*

### **I. Rationale:**

This course is designed to reveal the nature of scientific inquiry and revolution. How did a person's ideas and hypotheses shape the knowledge gained in the realm of neurobiology and neuroscience? How do these continue to shape how we think about the brain in our modern times? Our class goal, as students and as educators, is to discover how we are all a continuation of the history of neuroscience. This course transforms you from a student into a researcher, an investigator, and a discoverer in the field of psychobiology. You will cultivate an appreciation for controversies in neuroscience, the hypotheses that prevailed and methodologies that developed to advance (or suppress) one idea over another.

### **II. Course Aims and Outcomes:**

You already have a fundamental understanding of how the brain works by taking your pre-requisite psychology courses. This Advanced Topics course takes your existing knowledge to the next level by discussing how our current understanding of brain function came about. Furthermore, we will find how the questions neuroscientists and neurobiologists ask today are deeply rooted in the assumptions and controversies of our past. Use this course as your bridge to appreciate current research goals in brain science and to think critically about your own questions, hypotheses and ideas for methodologies that will take us into the future to discover how the brain (really) works.

#### ***Specific Learning Outcomes:***

By the end of this course, you will:

- Learn to find, read, analyze and evaluate scientific literature

- Compare and argue for/against different sides of controversies in neuroscience during in-class discussions
- Hone critical thinking skills in order to determine why some published results are more/less compelling than others
- Develop independent learning strategies and study habits
- Identify historical contexts of neuroscientific discovery
- Review concepts and current understanding of brain organization and function
- Trace citation(s) of primary scientific literature to discover its impact over time
- Develop research skills and become familiar with useful research engines
- Construct and write a written report highlighting one figure in neuroscience and his/her contributions to neuroscience
- Transform your written report into a presentation that will teach your class peers (and professor!) about the importance of your chosen historical figure
- Learn how to evaluate your peers with constructive criticism
- Develop an appreciation of the ebb and flow of ideas in the history of science

### III. Format and Procedures:

#### Participation (150 pts):

You will each start off with 100 points in this category. This being a discussion-based class, attendance and participation are essential to succeed with an A in the class. If you are more than 10 minutes late, you will have 10 points deducted. If you miss a class and can not provide proof of a valid reason for your absence, 25 points will be deducted. *Please inform me now if you know of planned absences (job or grad school interviews, etc.) so that we may make arrangements for make-up quizzes, discussions, etc. if necessary and appropriate.* The remaining 50 of your Participation points will be accumulated over the course of the semester in the form of pop-quizzes and in-class activities.

- A word about pop quizzes (5 pts each):
- A few questions may be given before lecture pertaining to information readily available in assigned readings in the textbook or other assigned readings (papers, online publications, etc.). These pop-quizzes are EASY and meant to be a simple and freebie way to add up points for your grade over the semester. Do your reading ☺ But please take note that it is impossible to receive any credit if you are late to class that day and did not take the quiz.

#### Weekly Blog (50 points):

You will be required to record your ideas, research plans, impressions of the class discussion(s), questions, etc etc etc. in the form of an online journal (aka blog) entry every week. Keep it simple, but rich with content (3-4 sentences can be enough). *What's the point?* Your success in the class will depend on how often and frequently you think about the issues covered in class, how much reading and thinking you do about what you have read, and thinking about what/who you want to cover for your term paper from Week One (Yes: think, think, think.). Your blog entries are a kind of notebook that you can look back on over the next few months as you develop your ideas, make progress in your research, and ultimately use all of this information to aid you in writing your paper. This is also a venue for you to communicate questions that you have about the content covered in class and how the discussions make you feel. I will check your entries weekly on Monday mornings, so make sure to have an entry in by Sunday at 11:59pm. We can adjust our class discussions during the following week to accommodate the questions or discussion points brought up in your Journal. So I invite you to let me know what you are thinking and feeling! Blogs should be entered on Sakai.

### Mid-Term Exam (200 points):

This will test your critical thinking skills – not just the retention of facts, ideas, and controversies discussed in class until this point. Focus will be to test how you think, more than how much information you can regurgitate on an exam. However you will be expected to support statements with evidence from literature and your research. The format will be several short-answer essay Qs.

### Term Paper (400 points):

Term Papers will be submitted in electronic form to *TurnItIn.com* as well as in paper format directly to me before lecture begins at 7:05 pm. Reports should be typed, single-spaced, using 12 point Times New Roman font with 1½ -inch margins and no more than 6 pages. Please include a cover page with your paper's title, your name and ID#, my name, the date, and course (this should be the only page of the report showing your name). Every page of the term paper should be numbered at the bottom right-hand corner and have your *student ID# only* in the top right-hand corner. After your Literature Cited page, please provide me with the abstract/first page of any references you have used (use at least two per report – at least one must be a primary research paper from a peer-reviewed journal article). I will give specific guidelines about the structure and format of the paper in a separate handout, which will also be posted on Sakai. But here is the basic idea:

- Pick an individual (i.e., a person) in the history of neuroscience. This will be the focal point and topic of your paper. Try to find a picture of him/her; you will get to “know” this person.
- Understand the years of the active work in neuroscience and the cultural context
- Determine the scientific issue, hypothesis, approach, significant result(s), and this individual's interpretation of that result(s).
- Track and identify the impact of this person and his/her work on future work in neuroscience or on current understanding of brain organization or function. Or, if there is no immediate evidence of impact, hypothesize the potential impact of this person's contribution to neuroscience.
- *Fun fact:* Lots of impactful neuroscientists are our contemporaries, i.e., they are alive and respond to email! Contact them; ask if you can quote them; get the real insiders view of what happened, when and why.

### Oral Presentation (100 points) + Peer evaluation (100 points):

You will transform your paper into a presentation (using Powerpoint, Keynote, Prezi, or a similar program of your choice with my approval) that you will present to the rest of the class in a 20-25 minute talk. You will get a template of how to make your slides and how to structure your talk. You will receive a grade in points out of 100 possible from me for the content and organization of your talk. Detailed information about my expectations for your presentations will follow later in the semester. I will give an example talk during our first class meeting after the Spring Break.

Peer evaluation is exactly what it sounds like: getting a grade from your peers! Giving an oral presentation is all about EFFECTIVE COMMUNICATION. The peer evaluation will be anonymous and determined from the total number of points allocated to you by 3 of your classmates (randomly selected). Points will be tallied in a rubric (created by me) that will outline all the essential components of an effective presentation (i.e., for effective communication of your content) like speaking style, slide organization, slide appearance, pace, use of technology (like laser pointers, slide animations, etc.) in addition to the content of your talk. I will review each and every peer evaluation to verify that all assessments are fair and balanced. Your final peer evaluation points will be the average of your 3 anonymous peer reviewers.

## Final Exam (0 points):

Guess what? There will be no final exam. Instead, you should be thinking about your Term Paper from Day One and Week One and on. Blog about your ideas and develop them. The paper will be a wonderful culmination of our time together in class and of your research at home (in the library, online, etc.). As such, the paper will be worth the largest percentage of your grade.

*Some other important things to know:*

Late assignments: Assignments *not* handed in before the beginning of lecture at 5:05 pm are considered LATE – no exceptions! Submitting your work any time after this on the same day will result in a 10% penalty. Each day after will result in a further 20% penalty. Late work is to be submitted to office with your name and the date.

Academic Dishonesty: Please don't even try it. You are welcome to discuss ideas and concepts with your peers but each report must be written individually. If there is reason to believe that any part of your work is not your own, you will receive a ZERO for that report. Any cheating and plagiarism will not be taken lightly and could even result in automatic failure of the course. All writing assignments WILL be rigorously checked for plagiarism (e.g., TurnItIn.com). Please consult with me directly concerning any questions or concerns.

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### *Class Format ...*

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|-------------|--|
| 5:00 pm     | Class begins. Hand in any and all assignments – add your name, date and Student ID# please!                                |
| 5:05 pm     | Door closes and lecture begins. If I decide that there is a pop-quiz that day, it will begin at 5:05 pm and end at 5:10pm. |
| 6:05 pm-ish | Wrap-up discussion, sharing ideas, research discoveries and questions/concerns about the paper and/or oral presentation.   |

***Be sure to check the online mailing list archive and Sakai regularly.*** Any class emails will also be archived there – so no excuses for not getting my emails due to inbox load errors or whatever. This is also where your Journal Entries should be submitted every week, so make a habit to keep up to date on Sakai. It is easy!

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## **IV. My Assumptions:**

You are encouraged to ask questions and discuss experiments, ideas and your papers openly among your peers, classmates, and professor. We are all here for you and for each other – so be inquisitive! It will only make the class that much better. I have essentially one general assumption: that the most important thing we need to do as researchers is IDENTIFY ASSUMPTIONS. We all have deeply engrained ideas about how the world, including the brain, works. Why?

The point of this class is to **ASK “WHY?”**

I will also mention here that this class centers on the idea of the biology of psychology (i.e., psychobiology). So a core idea of the class is that the processes of the mind are based in the biology of the body. *P.S. We will explore how the concept of “psycho-“ “biology” came about.*

Please do come and see me if you want to chat about the topics covered in class, or if something didn't make sense in lecture and/or discussion. Your first route for this kind of communication is via your weekly Online Blog Entry. The next best way to contact me is by email: [kasia.bie@rutgers.edu](mailto:kasia.bie@rutgers.edu) to set up an Office Hours appointment. When coming to office hours, have questions ready for me! It will produce the most efficient use of our time together. If at all possible, email me your questions before hand so I can be better prepared to help out. The more you ask and we discuss, the more the benefit for everyone!

## V. Course Requirements:

The tasks and assignments are aligned with the learning outcomes in skills, knowledge, attitudes and values I hope you will leave the course with.

**1. Class attendance and participation:** Please don't be late to class – I really don't want you to be losing points for this (participation points plus any points awarded that day for quizzes/assignments/etc)! At 5:05 pm I will close the door and begin lecture. If I have to open the door to let you in to class, you are LATE. If you miss a class meeting, you will still be responsible for material covered in class, but you will miss you on that day's participation points and any points awarded for pop-quizzes. This is truly a discussion-based class, which means that it will be most enjoyable and rewarding if we are all there to chat about the topics and issues covered over the course of the semester.

### **2. Course readings:**

**(a)** Required text: *Minds Behind the Brain: A History of the Pioneers and Their Discoveries*. By Stanley Finger (Oxford University Press 2005)

**(b)** Additional background readings, links to more (text)books of interest, and historical papers in neuroscience will be made available by me or your peers on the Sakai website.

## VI. Grading Procedures:

Grades will be based on:

<b>(a)</b> In-class participation (which requires attendance!)	[15% or 150 points]
<b>(b)</b> Mid-term	[20% or 200 points]
<b>(c)</b> Term paper (i.e., written report)	[40% or 400 points]
+ Weekly blog entries	[ 5% or 50 points]
<b>(d)</b> Oral presentation	[10% or 100 points]
+ Peer evaluation	[10% or 100 points]
<b>TOTAL:</b>	<b>100% or 1000 points</b>

## VII. Academic Integrity:

Each student in this course is expected to abide by the Rutgers University Code of Student Conduct and Academic Integrity Policy. Any work submitted by a student in this course for academic credit will be the student's own work. For this course, collaboration is allowed in the following instances: *research strategies, peer-review of drafts of term paper, peer-review of oral presentation or other instances based upon special requests and my approval.*

Of course, you are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students, even to give ideas of which historical figures to select for your term paper. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, online forums, a diskette, or a hard paper copy. I am an avid fan of TurnItIn.com, so



## X. Tentative Course Schedule

[Note that you will be keeping a weekly blog throughout.]

*Schedule is subject to change to accommodate guest presenters & student needs.*

Topics	Readings	Purpose	Assignment
<b>January 20</b> Welcome to the History of Neuroscience	Our class syllabus, <i>Minds Behind the Brain (MBB)</i> Chapter 1.	General overview of course, expectations, and meet-n-greet!	
<b>January 22</b> Why ask questions about it?	<i>MBB</i> Chapter 2 & 3.	Weekly entries will be due to Sakai at the end of the week on Sunday by 11:59pm, but you can submit yours any time during the week.	Blog entry #1.
<b>January 27</b> How can we find it out anyway?	<i>MBB</i> Chapter 4.		
<b>January 29</b> What does it look like, really?	<i>MBB</i> Chapter 5.		Blog entry #2.
<b>February 3</b> Does introspection with it help?	<i>MBB</i> Chapter 6.		
<b>February 5</b> How do the parts fit together?	<i>MBB</i> Chapter 7.		Blog entry #3.
<b>February 10</b> Puzzle pieces.	<i>MBB</i> Chapter 9. (Yes, we'll skip 8 for now)		
<b>February 12</b> A real "special" part is found?	<i>MBB</i> Chapter 10.		Blog entry #4.
<b>February 17</b> More "special" parts.	<i>MBB</i> Chapter 12. (Yes, we'll do 12 before 11 after still skipping 8)		<b>Topic of paper due by 2/18.</b>
<b>February 19</b> Maps everywhere?	<i>MBB</i> Chapter 11.		Blog entry #5.
<b>February 24</b> What's in a map?	<i>MBB</i> Chapter 11 & assigned reading.		
<b>February 26</b> Mush turns into nets?	<i>MBB</i> Chapter 13.		Blog entry #6.
<b>March 3</b> Sparks or Soups?	<i>MBB</i> Chapter 8 & 16.		<b>Primary research article on your topic due by 4/4.</b>
<b>March 5</b> Can we find spaces in between?	<i>MBB</i> Chapter 14.		Blog entry #7.
<b>March 10</b> Why does technology matter?	<i>MBB</i> Chapter 15.		
<b>March 12</b> Finally! Back to the Future.	<i>MBB</i> Chapter 17 & 18.		Blog entry #8.
<b>Spring Break</b>			
<b>March 24</b> Example presentation by Dr. B.	Assigned reading.	You will see how each of your presentations should flow, look, and contain. But add in your own personality!	<b>Term paper title and outline due by 3/25</b>

<b>March 26</b> Student presentation 1 & 2	Peer-assigned readings, packet, handouts, etc.	You will each draw a number randomly to assign your presentation day. There will be 2 talks per class meeting.	Blog entry #9.
<b>March 31</b> Student presentation 3 & 4	"		
<b>April 2</b> Student presentation 5 & 6	"		Blog entry #10.
<b>April 7</b> Student presentation 7 & 8	"		<b>You should have a working draft of your paper ready by now-ish</b>
<b>April 9</b> Student presentation 9 & 10	"		Blog entry #11.
<b>April 14</b> Student presentation 11 & 12	"		
<b>April 16</b> Student presentation 13 & 14	"		Blog entry #12.
<b>April 21</b> Student presentation 15 & 16	"		<b>Peer-review of Term Paper draft due by 4/22.</b>
<b>April 23</b> Student presentation 17 & 18	"		Blog entry #13.
<b>April 28</b> Student presentation 19 & 20	"		
<b>April 30</b> Student presentation 21 & 22	"		Blog entry #14.
<b>May 4-8 Reading Week</b>	...and writing week!		<b>Term Paper due by 5/10.</b>

## XI. Additional Resources for Readings and Research

In addition to our class textbook, you may want to check out the following texts and resources to *find* and *find out about* your person of interest:

<http://www.sfn.org/about/history-of-neuroscience/autobiographical-chapters>

<http://www.sfn.org/about/history-of-neuroscience/autobiographical-videos-of-prominent-neuroscientists>

<http://www.sfn.org/about/history-of-neuroscience/classic-papers>

<http://www.sfn.org/~media/SfN/Documents/TheHistoryofNeuroscience/Robert%20Doty%20Chapter.ashx>

<http://www.nasonline.org/publications/biographical-memoirs/online-collection.html>

<http://www.sfn.org/about/history-of-sfn/the-creation-of-neuroscience/introduction>

<http://www.neurotree.org>



## XII. List of (Some) Historical Figures in Psychobiology

Alcmaeon	Muller	Turner	Broca	Nissl
Hippocrates	Helmholtz	Ecker	Spencer	Turck
Plato	Hermann	Malpighi	Hugh Jackson	Gudden
Aristotle	Bernstein	Leeuwenhoek	Magnus	Fleschsig
Herophilus	Overton	Ruysch	Magendie	Galvani
Erasistratus	Lucas	Ehrenberg	Ferrier	Volta
Rufus of	Forbes	Valentin	Bolk	Marc Dax
Ephesus	Adrian	Gennari	Larsell	Charcot
Galen	Erlanger &	Baillarger	Lowenthal &	Loewi & Dale
Avicenna	Gasser	Ramak	Horsley	Levi-Montalcini
Mondino	Hodgkin	Meynert	Adrian	Charles K. Mills
Leeuwenhoek	Bernard	Betz	Magoun &	Charles H.
Fontana	Elliott	Lewis	Snider	Fraizer
Ehrenberg	Dale	Ramon y Cajal	Aranzi	Ruysch
Valentin	Loewi	Campbell	Massa	Pick's
Remak	Dale	Brodmann	Haller	Alzheimer's
Purkyne	Pourfour du	The Vogts	Cotugno	Parkinson's
(Purkinje)	Petit	Nemesius	Luschika	Kliver-Bucy
Schwann	Huber	Avicenna	Key & Retzius	Creutzfeld-
Hannover	Vicq D'Azyr	Prochaska	Dandy	Jacobs
Koellinker	Stilling	Rolando	Goldmann	Tourette
Deiters	Koelliker	Flourens	Weed	Leipmann
Waller	Flechsigs	Hitzig/Fritsch	Berengario	Gerstmann
Kuhne	Araetus	Bartholow	Da Capri	Scoville
Ranvier	Mistichelli	Ferrier	Wepfer	Brenda Milner
Nissl	Turck	Grunbaum &	Beevor	McLean
Virchow	Legallois	Leyton	Pfeifer	Brown-Sequard
Gerlach	Bell	Krause	Monro	Schiff
Golgi	Magendie	Panizza	Kellie	Henning
Ehrlich	Muller	Munk	Donders	Zwaardemaker
His	Brown-Sequard	Henschen	Roy &	Swedenborg
Forel	Eckhard	Minkowski	Sherrington	James & Lange
Ramon y Chal	Turck	Holmes	Hill	Bichat
Waldeyer	Sherrington	Schafer & Brown	Cushing	Papez
Held	Whytt	Bianchi	Jensen	Henry Head
Barker	Unzer	Fleschig	Forbes & Cobb	O. Foerster
Harrison	Prochaska	Brodmann	Schmidt & Kety	Ebbinghaus
Praxagoras	Hall	Goltz	Steno	Donald Hebb
Vesalius	Weber Brothers	Monakow	Varolio	W. Penfield
Descartes	Erb	Lashley	Gall &	Fulton
Willis	Westphal	Gudden	Spurzheim	Jean Baptiste-
Borelli	Babinski	Dusser de	Tiedmann	Bouillard
Glisson	Sechenov	Barenne &	Reil	William James
Haller	Pavlov	McCulloch	Hannover	Bliss & Lomo
Monro II	Piccolomini	Varolio	Stilling	Roger Sperry
Galvani	Tiedemann	Vieussens	Blum	Larry Squire
Aldini	Owen	Malacarne	Gerlach	Hubel & Wiesel
Matteucci	Leuret	Reil	Golgi	Ralph Gerard
Du Bois-	Gratiolet	Luciani	Weigert	Donald Lindsley
Reymond	Huschike	Auburtin	Marchi	

**For further information or to discuss specific questions, please post to your blog, or check our class Sakai website. Email [kasia.bie@rutgers.edu](mailto:kasia.bie@rutgers.edu) to schedule an Office Hours appointment.**