

History of Brain Science [830:415]



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 2017

Allison Road Classroom Bldg. Room 205 (ARC 205, Bldg. #3878 on rumaps)

Tues/Thurs 5:00-6:20pm

Instructor: Dr. Kasia Bieszczad
Office: Psychology Building Room 227
Email: kasia.bie@rutgers.edu Class email: brainhistory@sakai.rutgers.edu

Office Hours: Tuesday evenings (after class) 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.*

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):

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.

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 <u>at</u> 5:05 pm and end <u>at</u> 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!

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 that this class centers on the biology of psychology (i.e., psycho-biology). 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-” and “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 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 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:

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

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

all papers will be uploaded and compared against any existing History of Neuroscience papers and published reports.

Please ask me if you would like assistance in appropriate ways to cite previously published work. That's one great reason to schedule an office hour appointment with me!

And visit <http://academicintegrity.rutgers.edu/resources-for-students> for info and useful links.

Should copying occur, both the student who copied work from another student and the student who gave material to be copied could both automatically receive a zero for the assignment. Penalty for violation of the University Code of Student Conduct can also be extended to include failure of the course and University disciplinary action. The risk really isn't worth it.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examination will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

VIII. Accommodations for students with disabilities:

In compliance with the Rutgers University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first two weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with the RU Office of Disability Services to verify their eligibility for appropriate accommodations and provide me with appropriate documentation. We will be able to make arrangements for you, no problem!

IX. Inclusivity Statement:

We understand that our members represent a rich variety of backgrounds and perspectives. The Psychology Department is committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value each other's opinions and communicate in a respectful manner
- use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the Rutgers U. community

Note: This syllabus is our contract, student-to-teacher and teacher-to-student, that you and I will commit to this course with integrity, honesty, enthusiasm and an open mind to new ideas and various points of view. We will treat each other and our classmates with respect and patience and remember to listen as much as we speak.

Signed, KMB 1/06/2017

Signed,

X. Tentative Course Schedule

[Note that you will be keeping a weekly blog throughout the semester...see Blog Entry #s]

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

Topics	Readings	Purpose	Assignment
Tues. January 17 Welcome to the History of Neuroscience	Our class syllabus, <i>Minds Behind the Brain-</i> <i>Preface & Chapter 1.</i>	General overview of course, expectations, and an intro to our Sakai Website.	Your first Quiz will be posted on Sakai... <i>It's open book, so no worries, folks.</i>
Thurs. January 19 A Special Guest to inspire your History of Neuroscience papers and presentations.	<i>Minds Behind the Brain (MBB) Chapter 1&2.</i>	Ask our special guest questions about how to get to know the "people behind scientific discoveries". Listen and learn!	
Tues. January 24 Why ask questions about it?	<i>MBB Chapter 2&3.</i>	And now... a meet-n-greet! Modernization with Hippocrates.	Blog entry #1. Weekly entries will be due at the end of the week to Sakai on Sunday by 11:59pm , but feel free to submit yours any time earlier during the week.
Thurs. January 26 How can we find it out anyway?	<i>MBB Chapter 4.</i>	Galen, The Father.	
Tues. January 31 What does it look like, really?	<i>MBB Chapter 5.</i>	Vesalius, The Anatomist	Blog entry #2.
Thurs. February 2 Does introspection with it help?	<i>MBB Chapter 6.</i>	Descartes, The Searcher	
Tues. February 7 How do the parts fit together?	<i>MBB Chapter 7.</i>	Willis, The Original	Blog entry #3.
Thurs. February 9 Puzzle pieces.	<i>MBB Chapter 9.</i> (Yes, we'll skip 8 for now)	Gall, The Cartographer	
Tues. February 14 A real "special" part is found?	<i>MBB Chapter 10.</i>	Broca, The Frenchman	Blog entry #4.
Thurs. February 16 More "special" parts.	<i>MBB Chapter 12.</i> (Yes, we'll do 12 before 11 after still skipping 8)	Charcot, The Psychologist	Topic of paper due by 2/18.
Tues. February 21 Maps everywhere? And what's in a map anyway?	<i>MBB Chapter 11 & assigned reading.</i>	Ferrier & Hitzig, En Garde!	Blog entry #5.
Thurs. February 23 Mush turns into nets? Filled with... Sparks or Soups?	<i>MBB Chapter 8 & 16.</i> (Read Chapter 13 for additional background).	Galvani vs. Loewi vs. Dale, in The War	
Tues. February 28 Can we find spaces in between?	<i>MBB Chapter 14.</i>	Sherrington, The Thinker	Blog entry #6.
Thurs. March 2 Why does technology matter?	<i>MBB Chapter 15.</i>	Adrian, The Recorder	Primary research article on your topic due by 3/7.
Tues. March 7 Finally! Back to the Future.	<i>MBB Chapter 17 & 18.</i>	The Wonderment.	Blog entry #7. ARTICLE DUE.

Thurs. March 9 ~MIDTERM EXAM~	The exam will be held in our regular classroom ARC 205 at the regular class time, <i>i.e.</i> , you will have 90 minutes to finish.		
Spring Break But remember that your Blog entry #8 is due before class on 3/22!			
Tues. March 21 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!	Term paper title and outline due by 3/23
Thurs. March 23 Student presentation 1 & 2	Peer-assigned readings, packet, handouts, etc.	Your drawn number from our first class together randomly assigns your presentation day. There will be 2 talks per class meeting.	Blog entry #9.
Tues. March 28 Student presentation 3 & 4	"		
Thurs. March 30 Student presentation 5 & 6	"		Blog entry #10.
Tues. April 4 Student presentation 7 & 8	"		You should have a working draft of your paper ready by now-ish
Thurs. April 6 Student presentation 9 & 10	"		Blog entry #11.
Tues. April 11 Student presentation 11 & 12	"		
Thurs. April 13 Student presentation 13 & 14	"		Blog entry #12.
Tues. April 18 Student presentation 15 & 16	"		Peer-review of Term Paper draft due by 4/20.
Thurs. April 20 Student presentation 17 & 18	"		Blog entry #13.
Tues. April 25 Student presentation 19 & 20	"		
Thurs. April 27 Student presentation 21 & 22	"		Blog entry #14.
May 2-3 Reading Days May 4-10 Exam Days	...and writing week! <i>~Please keep the scheduled day for our final exam open.~</i>		Term Paper due Mon. May 8th

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

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