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

Fall 2022

Class Meeting Times: Mon/Thurs 12:10-1:30pm at <u>BECK-101 Livingston Campus</u>

Instructor: Dr. Kasia Bieszczad

Office: Psychology Building Room 327

Email: kasia.bie@rutgers.edu

Office Hours: Wednesday afternoons (12:30-1:30pm) via **ZOOM** or **in-person** meetings

Zoom link: https://rutgers.zoom.us/j/91837458392?pwd=dTZrSUNTbGg0V2Ixb0dMSXhGTDVkdz09

Grading: You will receive a letter grade (worth your 3 credits) based upon assignment

evaluations (e.g., weekly pop-quizzes and peer-evaluations of projects), Discussion post (one per week), class participation (this involves in-person and online activities!), two non-cumulative midterms, 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 inclass 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 (250 pts):

This being a discussion-based class, your in-person AND online (in Canvas) participation are essential to succeed with an A in the class. If you continuously fail to submit Discussion board posts and replies and can not provide proof of a valid reason for your absence in class, 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, one-one-one discussions, etc. if necessary and appropriate. I will be reasonably flexible given the uncertainty for many of us given health & safety concerns (e.g., COVID-19). The remaining Participation points will be accumulated over the semester in the form of pop-quizzes.

- A word about **pop quizzes** (~20 pts each; 100 points total):
- 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 submit your responses and missed the open time window in which to take the quiz. Pop quizzes are on the *prior* week's readings.
- Each and every one is welcome to SUBMIT TO ME a pop quiz question from that week's reading (with the correct answer) that I may use in the pop-quiz for the whole class that week. Questions submissions are due by email (kasia.bie@rutgers.edu) by Sunday at midnight. If I happen to select yours, lucky you because you will know the answer!

Weekly **Discussion "Blog"-style** post in CANVAS (150 points;—see Schedule):

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 using the **Discussion** function on CANVAS. 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 Discussion post 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 the **Discussions**. So I invite you to let me know what you are thinking and feeling! Feel free to also respond to someone else's blog entry—lets get a real "discussion" going! <u>Blogs should be entered using the **Discussion** function in CANVAS under the appropriate week/chapter.</u>

Mid-Term Exam (2 x 150 points each, for a total of 300 points):

There will be TWO Mid-Terms, which 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. Each Exam will be worth 100 points.

Term Paper (250 points):

Term Papers will be submitted in electronic form to CANVAS and will be cross-checked for originality using *TurnItIn.com*. Reports should be typed, **single-spaced**, using 12-point Times New Roman font with 1½ -inch margins and approximately **6 pages** in length (you can go slightly over or under, but 6 pages is a good benchmark). Please include a **cover page** with your paper's title, your name and ID#, my name, the date, and course (this should be the first page and 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 later this semester, which will also be posted on CANVAS. But here is the basic idea:

- Pick an individual (i.e., a person) in the history of neuroscience. This will be your paper "topic". Find a picture of him/her; you will get to "know" this person and his/her science.
- Start thinking about what your topic might be TODAY! Sooner the better so you can plan.
- 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). *You will understand more about what I mean by these terms once we have a few classes together.
- 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 their 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 insider's 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 mid-semester break. You can use my office hours to meet one-on-one if you need more help. Don't worry © You can do it!

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 *at least* 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 slide animations, videos, online recording tools, 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. All peer-evaluations will be assigned by me and will follow a detailed rubric (more on that later).

<u>Final Exam</u> (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. Post your ideas on your CANVAS Discussion board and develop the ideas using feedback from your Professor and Peers. 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:

<u>Late assignments</u>: Assignments *not* handed in on the date due (by 11:59pm) 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. All work is to be submitted to CANVAS, which will document your name and the date & time of submission.

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. Use of external website resources such as Chegg.com or others to obtain solutions to homework assignments, quizzes, or exams is cheating and a violation of the University Academic Integrity policy. Cheating in the course may result in grade penalties, disciplinary sanctions or educational sanctions. Posting homework assignments, or exams, to external sites without the instructor's permission may be a violation of copyright and may constitute the facilitation of dishonesty, which may result in the same penalties as plain cheating. 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.

<u>Academic Integrity</u>: Students are expected to maintain the highest level of academic integrity. You should be familiar with the university policy on academic integrity (—Click the link). Violations will be reported and enforced according to this policy. Note on academic integrity in the online environment (https://nbprovost.rutgers.edu/academic-integrity-students).

<u>Yours and Mine, Intellectual Property</u>: Almost all original work is the intellectual property of its authors. These works may include syllabi, lecture slides, recorded lectures, homework problems, exams, and other materials, in either printed or electronic form. The authors may hold copyrights in these works, which are protected by U.S. statutes. Copying this work or posting it online without the permission of the author may violate the author's rights. More importantly, these works are the

product of the author's efforts; respect for these efforts and for the author's intellectual property rights is an important value that members of the university community take seriously.

For more on copyright protections at Rutgers U., please refer to Rutgers Libraries (\leftarrow Click).

Class Format

As an "asynchronous remote" class, it means that all lectures are pre-recorded and it is up to you to plan to view them regularly. I recommend sticking to the original time schedule as much as you can (Mon/Thurs).

- Lectures will be on Monday and Thursday afternoons.
- If there is a pop quiz, you MUST be in class to know about it, take it, and earn points.
- Sending me a candidate pop quiz question? Then send it by Sunday at midnight to be considered.
- Assignments (e.g., posting to Discussion blog posts) will be due Sunday at midnight (11:59pm).

Be sure to check your email and CANVAS regularly. Any class emails will also be archived – so no excuses for not getting my emails due to inbox load errors or whatever. All of your assignments and lectures to watch will be on CANVAS, so make a habit to keep up to date on CANVAS. 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 <u>biology</u> 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 schedule a time to see me (via ZOOM or in-person Office Hours) 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 Discussion post. The next best way to contact me is by email: kasia.bie@rutgers.edu to set up an Office Hours appointment on ZOOM or in-person in my office. 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. <u>Class attendance and participation</u>: Please do everything you can to be "present" oinline this semester. This will be important to keep your self-paced learning on track, and to make sure you can submit all pop-quizzes on time. This is truly a discussion-based class, which means that it will be

most enjoyable and rewarding if we are all there to **Chat** and have **Discussions** 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). The full text can be accessed with a Rutgers VPN login. Click the link below from a Rutgers computer:

https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/978019518182 1.001.0001/acprof-9780195181821-miscMatter-1

(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 CANVAS website.

3. Technology Requirements for Online Learning:

- (a) Computer or tablet, internet access, speaker, microphone, and (optional) video camera.
- **(b)** Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students <u>deanofstudents@echo.rutgers.edu</u> for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at https://financialaid.rutgers.edu/.

VI. Grading Procedures:

Grades will be based on:

(a) Participation (in-person discussion, online presence in blogs, and peer-reviews)

+ Weekly Discussion blog entries			[15% or 150 points]
+ Pop Quizzes (1st half of course)			[10% or 100 points]
(b) TWO Mid-terms	(each worth 15%)		[30% or 300 points]
(c) Term paper	(i.e., written report)		[25% or 250 points]
(d) Oral presentation	(graded by Dr. B.)		[10% or 100 points]
+ Peer evaluation	n (graded by peers)		[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. Chatting, texting, or other forms of 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

X. Tentative Course Schedule

[Note that you will be keeping a weekly blog throughout the course...see Discussion Blog # below]
Schedule is subject to change to accommodate any guest presenters & student needs.

Topics	Readings	Purpose	Assignments
Thurs. September 8th Orientation to the History of Brain Science *Note: No in-person class today! Check out Canvas for today's materials and goals.	Check out CANVAS—it is our <i>supplemental</i> learning platform to our in-person class meetings this semester. Make sure you can use & access ZOOM—you can use it for office hours with Dr. B.	Orientation to the Canvas site, Reviewing the Syllabus, and Rutgers Shout- Outs!	Log in to CANVAS. Open & read & agree to terms in the Syllabus via the Discussions tab. Complete the Rutgers Shout-Out!
Mon. September 12th Welcome to the History of Brain Science	Our class syllabus, Minds Behind the Brain- Preface & Chapter 1.	overview of the purpose of this course, classroom expectations, and in-person meet-n-greet!	Agree to the terms of the Syllabus in the Discussions and take Trial Run Quiz on Canvas. *due on Monday (today) by 11:59pm
Thurs. September 15th Why ask questions about it?	Minds Behind the Brain (MBB) Chapter 2 & 3.	Modernization with Hippocrates.	Discussion Blog entry #1. Weekly entries are due to CANVAS on Sunday by 11:59pm, but feel free to submit yours any time earlier during the week.
Mon. September 19 th How can we find it out anyway?	MBB Chapter 4	Galen, The Father.	
Thurs. September 22 nd What does it look like, really?	MBB Chapter 5.	Vesalius, The Anatomist	Did you remember your Discussion Blog entry #2?
Mon. September 26 th	MBB Review Workshop of Chapters 1&2&3&4&5. *Bring questions for Dr. B. and each other!		
Thurs. September 29 th Does introspection with it help?	MBB Chapter 6.	Descartes, The Searcher	Remember to submit a Discussion Blog #3.
Mon. October 3 rd How do the parts fit together?	MBB Chapter 7.	Willis, The Original	
Thurs. October 6 th Puzzle pieces.	MBB Chapter 9. (Yes, we'll skip 8 for now)	Gall, The Cartographer	Remember to submit a Discussion Blog #4.
Mon. October 10 th ~MIDTERM EXAM 1~	The exam will be held onlin	ne today, i.e., you will Details to follow.	have 90 minutes to finish.
Thurs. October 13 th A real "special" part is found?	MBB Chapter 10.	Broca, The Frenchman	Using CANVAS. Assignments: Topic of paper due by 10/16. Remember to submit a Discussion Blog #5.

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Mon. October 17 th More "special" parts.	MBB Chapter 12. (Yes, we'll do 12 before 11 after still skipping 8)	Charcot, The Psychologist	
Thurs. October 20 th Maps everywhere? And what's in a map anyway?	MBB Chapter 11 & assigned reading.	Ferrier & Hitzig, En Garde!	Remember to submit a Discussion Blog #6.
Mon. October 24 th Mush turns into nets? Filled with Sparks or Soups?	MBB Chapter 8 & 16. (Read Chapter 13 for additional background).	Galvani vs. Loewi vs. Dale, in The War	Using CANVAS_ Assignments: Primary research article on topic due today, 10/24
Thurs. October 27 th How does it all link up?	MBB Chapter 17 (especially pgs. 284-290)	Levi-Montalcini, The Guide	Remember to submit a Discussion Blog #7.
Mon. October 31st Can we find spaces in between?	MBB Chapter 14.	Sherrington, The Thinker	
Thurs. November 3 rd Why does technology matter?	MBB Chapter 15.	Adrian, The Recorder	Remember to submit a Discussion Blog #8.
Mon. November 7 th Looking Back, to the Future.			Using CANVAS Assignments: Term paper title and outline due by 11/13
Thurs. November 10th ~MIDTERM EXAM 2~	The exam will be held online today, i.e., you will have 90 minutes to finish. Details to follow. *Once exam dust has settled, check out an example presentation by Dr. B. on Canvas to help you prep your talks for the second half of the semester!		
Mon. November 14 th Student presentation 1 & 2	Peer-assigned readings, packet, handouts, etc.	Your drawn number from our first class together assigns your presentation day. There will be 2-3 talks per class meeting.	Starting today, you will be posting comments about your peers' presentations to "Discussion" on CAVNAS. Remember to submit your Discussion posts by Sundays at 11:59pm!
Thurs. November 17 th Student presentation 3 & 4			Remember to submit a Discussion Blog #9.
Mon. November 21st Student presentation 5 & 6 & 7	o		
Tues. November 22 nd Student presentation 8 & 9 *Note: Thurs. classes are Tues. today!	o		You should have a working draft of your paper ready by now in order to give it to a peer. Remember to submit a Discussion Blog #10.
Thurs. November 24th	THANKSGIV	VING DAY BREAK	/ No Class.
Mon. November 28 th Student presentation 10 & 11 + Writing Workshop	o o	Dr. B. will host longer "open office hours" this week for any writing help you need.	Did you remember to submit your Discussion posts?
Thurs. December 1 st Student presentation 12&13&14	o		Remember to submit a Discussion Blog #11.

Mon. December 5 th Student presentation 15 & 16	o		Using CANVAS Assignments: Peer-review of Term Paper draft due today, 12/5.
Thurs. December 8 th Student presentation 17 & 18	o		Remember to submit a Discussion Blog #12.
Mon. December 12 th Student presentation 19 & 20	o		Remember to submit a Discussion Blog #13 by Sunday at 11:59pm!
Thurs. December 15 th	READING DAY / No Class. *this is also a great time to catch up your final paper writing!		
Fri. Dec. 16th-23rd Exam Days	and writing There will be no final exam.		Using CANVAS_ <u>Assignments</u> : Term Paper due on Sun. Dec. 18 th

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/classic-papers

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

http://www.neurotree.org

XII. List of (Some) Historical Figures in Psychobiology

Alcmaeon	Ehrlich	Erlanger & Gasser	Weber Brothers	Brodmann
Hippocrates	His	Hodgkin	Erb	The Vogts
Plato	Forel	Bernard	Westphal	Nemesius
Aristotle	Ramon y Chal	Elliott	Babinski	Avicenna
Herophilus	Waldeyer	Dale	Sechenov	Prochaska
Erasistratus	Held	Loewi	Pavlov	Rolando
Rufus of Ephesus	Barker	Dale	Piccolomini	Flourens
Galen	Harrison	Pourfour du Petit	Tiedemann	Hitzig/Fritsch
Avicenna	Praxagoras	Huber	Owen	Bartholow
Mondino	Vesalius	Vicq D'Azyr	Leuret	Ferrier
Leeuwenhoek	Descartes	Stilling	Gratiolet	Grunbaum &
Fontana	Willis	Koelliker	Huschike	Leyton
Ehrenberg	Borelli	Flechsig	Irving Diamond	Krause
Valentin	Glisson	Araetus	Turner	Panizza
Remak	Haller	Mistichelli	Ecker	Munk
Purkyne	Monro II	Turck	Malpighi	Henschen
(Purkinje)	Galvani	Legallois	Leeuwenhoek	Minkowski
Schwann	Aldini	Bell	Ruysch	Holmes
Hannover	Matteucci	Magendie	Ehrenberg	Schafer & Brown
Koellinker	Du Bois-Reymond	Muller	Valentin	Bianchi
Deiters	Muller	Brown-Sequard	Gennari	Fleschig
Waller	Helmholtz	Eckhard	Baillarger	Brodmann
Kuhne	Hermann	Turck	Remak	Goltz
Ranvier	Bernstein	Sherrington	Meynert	Monakow
Nissl	Overton	Whytt	Betz	Lashley
Virchow	Lucas	Unzer	Lewis	Gudden
Gerlach	Forbes	Prochaska	Ramon y Cajal	Dusser de Barenne
Golgi	Adrian	Hall	Campbell	& McCulloch

Varolio Cotugno Varolio Charles K. Mills Papez Charles H. Fraizer Luschika Gall & Spurzheim Henry Head Vieussens Malacarne Key & Retzius Tiedmann Ruysch O. Foerster Reil Dandy Reil Pick's Ebbinghaus Goldmann Hannover Alzheimer's Donald Hebb Luciani Auburtin Weed Stilling Parkinson's W. Penfield Fulton Berengario Blum Kluver-Bucy Broca Spencer Da Capri Gerlach Creutzfeld-Jacobs Jean Baptiste-Bouillard Wepfer Hugh Jackson Golgi Tourette Magnus William James Beevor Weigert Leipmann Magendie Pfeifer Bliss & Lomo Marchi Gerstmann Ferrier Monro Nissl Scoville Roger Sperry Bolk Kellie Turck Brenda Milner Larry Squire Larsell Donders Gudden Hubel & Wiesel McLean Lowenthal & Roy & Sherrington Fleschsig Brown-Sequard Ralph Gerard Galvani Schiff Donald Lindsley Horsley Hill Adrian Cushing Volta Henning Axelrod, Julius Magoun & Snider Jensen Marc Dax Zwaardemaker Bishop, Peter O. Forbes & Cobb Swedenborg Bernard Katz Aranzi Charcot Loewi & Dale Massa Schmidt & Kety James & Lange Benjamin Libet Haller Levi-Montalcini Bichat Steno Albe-Fessard Robert Galambos James Sprague Louis Sokoloff

For further information or to discuss specific questions, please post to your Chat blog, or check our class CANVAS website. Email kasia.bie@rutgers.edu to reserve an Office Hours appointment on Wednesdays (between 12:30-1:30pm) or to determine when to meet at a convenient ad hoc time.

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, <u>KMB 9/01/2022</u> Signed (by you), _____