INTRODUCTION TO BRAIN SCIENCE FOR BUSINESS
MKTG 2370/7370, Fall 2024 Q1
Tuesdays and Thursdays
UG: 1:45-3:15 PM; MBA: 3:30-5:00 PM
Location: 360 Jon M. Huntsman Hall
The Wharton School, University of Pennsylvania

*** THIS IS A DRAFT SYLLABUS AND IS SUBJECT TO CHANGE ***

COURSE SYLLABUS

Instructor
Michael L. Platt phone: (919) 280-8876 email: mplatt@wharton.upenn.edu office: 745 Jon M. Huntsman Hall **Office Hours:** by appointment

TAs
Elizabeth "Liz" Beard email: ebeard@wharton.upenn.edu **Robert "Robbie" Gamble** email: robgam@upenn.edu **Office Hours:** by appointment ***NOTE:*** *please CC both Liz and Robbie when emailing Professor Platt*

Overview

Can brain science help business? At first blush, this might seem like a bridge too far. After all, the efficiencies of the market virtually guarantee accurate asset pricing, marketing research and focus groups can test the efficacy of advertising, effective leadership can stimulate innovation and productivity, and sophisticated analytics can leverage big data to improve organizational structure to maximize return on investment. A deeper look, however, provokes the idea that brain science has enormous potential to inform business. We now know the basic architecture of the decision process in the human brain, from identification of choice options to the calculation of their utility, to selecting one for consumption, and learning from this experience. We are also beginning to understand how fundamental economic principles like risk, ambiguity, and volatility shape these processes, and why these factors seem to influence different people in different ways and in different choice contexts. Importantly, neuroscience provides a powerful tool for understanding the private reasons, such as emotional responses or the influence of others, people make the choices they do- reasons they themselves may not be aware of or even understand. Brain science offers the potential to unlock the mechanisms underlying what many people consider to be the keys to the future of business, including creativity and innovation, empathy and connecting with others, social awareness and the common good, how people use information to guide decision making, and the experience and impact of online vs. live interaction and pedagogy. New developments, including biometrics, implantable and wearable brain interfaces, genomics, proteomics, metabolomics, and the human microbiome, offer the opportunity for enhanced precision not only in marketing and finance, but also in the talent identification and the development of full human potential. We will also deeply consider artificial intelligence (AI) and its relationships to organic intelligence (OI), and use this analysis to understand how to strengthen human adaptability and resilience, enhance human-AI trust and teaming, and support human value and values through technological transformation.

Goals:

This course will provide an overview of contemporary brain science and its applications to business. Students will be introduced to the basic anatomy and physiology of the brain and become familiar with important techniques for measuring and manipulating brain function. The course will then survey major findings in neuroscience with applications to business, including selective attention and advertising; valuation and marketing; decision making and the tyranny of choice; learning, innovation and creativity; learning and performance; social influence, team-building, and leadership; and maximizing the good and minimizing the bad impacts of AI. The course will end with a discussion of the future of brain science in business, and a final session where teams will pitch new neuroscience applications for business.

Format:

The course will meet twice weekly in person, with additional self-directed independent reading and tsudy. Generally, the first 2/3 of each class will be an interactive lecture, followed by team-based work to develop a business application based on the material presented in class. Students will be randomly assigned to teams and all teams will be required to present once during the course. We will also have speakers from industry who will talk about their experience working at the intersection of neuroscience and business. At the end of the quarter, the final exam will be available for students to take online. More details about specific course requirements, assignments, and relevant dates follow below.

Grading:

There are several assessments for the course. One will be a team-based pitch of a business application with foundations in neuroscience. The second will be a cumulative final exam that seeks to test your understanding of the course material through practical application. Additionally, class participation, meme assignments, and in-class pitches will contribute to your final grade. Though the assessments will not be curved, your final grades will be re-weighted around a 3.5 GPA, as per Wharton MBA program requirements. Undergraduate students taking the course will not be subject to that curve. This class can be taken pass/fail. If you need accommodations, please be sure to let the TA know in advance and coordinate with the Weingarten Learning Resources Center (more information is below). More information on the capstone pitch session and exam are below. Additional information will be available closer to the date. Please email the TA for any questions or concerns. Please refer to the course itinerary for the exam date.

PLATTBucks (acquired based on investments in in-class pitches)	5%
Class Participation (including peer assessment and weekly feedback)	15%
Meme Assignment 1	10%
Meme Assignment 2	10%
Team-Based In-Class Pitch (including 250-word blurbs)	10%
Final Assessment	20%
Team-Based Final Pitch Presentation	30%

*final class distribution will be re-weighted around 3.5 GPA for MBA students

Readings:

There are two required books for the course: "*The Leader's Brain*" (henceforth LB) by Michael L. Platt (yours truly) and published by Wharton School Press. There is both an eBook ($12.99) and a paperback ($18.99) version available. The second required book is Unit V *Neuroscience* (henceforth NS) by Purves et al. eds. (including yours truly), published by Oxford University Press. There are also a number of additional readings, including primary scientific articles and popular media, which will be posted on Canvas.

Unrestricted use of Generative AI permitted:

Within this class, you are welcome to use AI models (ChatGPT, GPT, DALL-E, Stable Diffusion, Midjourney, GitHub Copilot, and anything after) in a totally unrestricted fashion, for any purpose, at no penalty, except for the in-class final exam. However, you should note that all large language models still can make up incorrect facts and fake citations ("hallucinations"); code generation models have a tendency to produce inaccurate outputs; and image generation models can occasionally come up with highly offensive or nonsensical products. You will be responsible for any inaccurate, biased, offensive, or otherwise unethical content you submit regardless of whether it originally comes from you or an AI program. If you use an AI program, its contribution must be acknowledged in the assignment; you will be penalized for using an AI program without acknowledgement. Having said all these disclaimers, the use of an AI program is encouraged, as it may make it possible for you to submit assignments of higher quality, in less time. The university's policy on plagiarism still applies to any uncited or improperly cited use of work by other human beings, or submission of work by other human beings as your own.

Academic Integrity:

Please re-familiarize yourself with the students' guide to Academic Integrity at Penn (http://www.upenn.edu/academicintegrity/index.html) and the Code of Academic Integrity: (http://www.upenn.edu/academicintegrity/ai_codeofacademicintegrity.html). You may and are encouraged to discuss class topics with other students in the class. However, your individual and group assignments, responses, and contributions to class are to be your own original work and must truthfully represent the time and effort you apply. Consult with the instructor if you have any questions about academic integrity expectations for this class. If you are unsure whether your work constitutes a violation of the Code of Academic Integrity, it is your responsibility to clarify any ambiguities.

Policies:

Accommodations: The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the office of Student Disabilities Services(SDS). If you have not yet contacted SDS, and would like to request accommodations or have questions, you can make an appointment by calling SDS 215-573-9235. The office is located in the Weingarten Learning Resources Center at Stouffer Commons 3702 Spruce Street, Suite 300. All services are confidential.

"Meme" Assignments:

You will submit two write-ups along with a unique "meme" referencing a topic or concept we've discussed in the course. In addition to the "meme" itself, you will need to submit a written explanation (500-750 words) describing your submission and explaining it's relevance to the course. "Memes" can be static images or video submissions (think TikTok). Additional instructions for the assignments will be posted on Canvas.

Shark-Tank - Team Pitch Presentations:

You will be randomly assigned into groups to develop and pitch a neuroscience-applied business idea. Your businesses should utilize the neuroscience concepts you've learned through the class.

In-Class Pitch:
At the end of every class, 2-4 groups will present an early version of their final pitch ideas. These pitches should be informal and take no more than 5 minutes. Under the "Assignments" tab on Canvas, you will find "In-Class Weekly Group Pitches" which you will need to submit by 11:59 PM on the day you present in-class. Your group will also need to submit a 250-word write-up of your pitch, elaborating on the idea your group for the lecture came to for a business idea/pitch relating to the subject matter covered on the day of your presentation. Your submission will be worth 10% of your final grade, so be sure to make the most of your 250-word limit and make sure to include course content in your response. Only the group leader needs to submit this assignment. Additional instructions for the assignments will be posted on Canvas.

PLATTBucks:
At the beginning of the quarter, all teams are endowed with 15 PLATTBucks. Teams can then "invest" by deciding which in-class pitches during class have the most suitable business idea (most classes will have 2-4 groups present). They can do so by wagering up to a maximum of 2 and a minimum of 0 PLATTBucks for each pitch. Then, Professor Platt will validate investments by choosing the best pitch. Teams who had the same decision will get 2x on their initial investment or will lose their initial investment if incorrect. Additional instructions for submitting investment decisions will be posted on Canvas.

In-Class Pitch Weekly Feedback:
After teams present their in-class pitches at the end of lectures, you will provide constructive feedback on your peers' ideas. Feedback should be given as comments on their brief write-ups in Canvas. Comments should be constructive and help teams strengthen their ideas by identifying areas of the concept that could be improved or clarified, parts of the idea that were strong, and parts of the idea that would be a potential challenge to address by the final pitch. Comments on the pitch are due one week after the team presents in class and are a significant part of the 15% participation grade. Feedback should be no more than 250 words and one paragraph. This feedback. Additional instructions for providing feedback will be posted on Canvas.

Final Pitch Presentation:
On October 8th, your team will present a 5-7 minute "Shark Tank" style pitch to the rest of the course. Pitches and business ideas will be graded based on the criteria in the table below. In addition to your pitch deck, your team will be asked to submit a brief (500-750 word) written summary of your business idea. The pitch deck and summary must be submitted by 11:59 PM on the day of the pitches.

Criteria:	**Maximum Points:**
Opportunity: The proposed idea has gone through careful diligence both qualitatively and quantitatively to sensitize whether or not there is value and a potential market and/or audience for the product or service.	20
Business Idea: The idea being pitched has effort put into it and fits well into the viable opportunity. There is a clear and understandable linkage between neuroscience and where the business idea will go.	20

Brain Science: The business idea or application for the proposed company has a clear and direct tie to one or multiple well-established and explained neuroscience concepts taught in the course.	20
Impact: There is a sizeable impact being forecasted by the product or service being pitched. Assessed for quality and value creation being driven to a community or population. A measureable component of the business has a tie to ESG.	20
Ethics: The team has carefully considered the business idea's social, psychological, and ethical ramifications if developed. An assessment of the potential consequences and mitigants for them has been conducted.	20
Total Points:	100

Final Assessment:

The final exam for this course will be taken online via Canvas. Once you begin, you will have 1.5 hours to complete the exam. Be sure you have a reliable internet connection before starting the exam to prevent any answers from being lost. The cumulative final exam will test your understanding of the course material through practical application. The questions typically follow a situation-answer style rather than rote memorization. However, it will be important to be familiar with specific, critical neuroscience topics such as brain anatomy and function. The exam will not be curved. However, questions will be re-visited by the TA for omission if deemed necessary according to the results of the exam. Accommodation requests should be made through the Weingarten Learning Resources Center (see information above).

UG Final Exam **10/15/2024**	**MBA Final Exam** **10/10/2024**
WHERE: **360 JMHH** WHEN: **Tuesday, October 15, 2024, 1:45 PM – 3:15 PM** LENGTH: **1.5 hours**	WHERE: **360 JMHH** WHEN: **Thursday, October 10, 2024, 3:30 – 5:00 PM** LENGTH: **1.5 hours**

Course Itinerary (8/27/24 - 10/8/24)

***tentative schedule**, may change according to guest speaker availability*

Tuesday	Thursday
Introduction to the Course **8/27/24**	**How Brains Work, How to Measure Brain Activity, and How to Manipulate It** **8/29/24**
TOPICS: Dr. Platt will introduce himself and his journey, as well as the goals and structure of the course. The TA will also introduce themselvf, office hours, procedures, etc. **HOMEWORK:** Read LB, Introduction	**TOPICS:** Introduction to the fundamentals of neurons and brains, as well as tools and technologies. **HOMEWORK:** Read NS, Chapter 1 & 27
Decision-Making: The Five-Step Process and How to Get It Right **9/3/24**	**Attention and Decision Making** **9/5/24**
TOPICS: Evidence accumulation, value scaling, divisive normalization, and the physiological basis of choice overload and decoy effects; implications for business decisions **HOMEWORK:** Read LB, Chapter 5 Chapter NS, Chapter 32	**TOPICS:** The visual system, salience, attention, and eye movements; effects of attention on evidence accumulation; applications to financial decisions, ad development, product design, and user experience **HOMEWORK:** Read LB, Chapters 5 & 6 NS Chapter 29
Driving Performance through Learning: Small Surprises Make It Stick **9/10/24**	**Neuromarketing and Brand Strategy** **REMOTE/VIRTUAL CLASS** **9/12/24**
TOPICS: Reinforcement learning (RL), reward prediction errors, dopamine, the equation for happiness, why we buy more on sunny days, why you should treat the weekend like a vacation. RL as a foundation for AI. **HOMEWORK:** Read NS, Chapter 6 & 31	**TOPICS:** Using neuroscientific tools to A|B test ads; forecasting market level impact of ads; using neuroscience to build brand loyalty and brand equity. The power of combining neuromarketing and AI. **HOMEWORK:** Celebrating Your Employees Brand Choice & Loyalty **"MEME" ASSIGNMENT 1 DUE @ 11:59PM**
Harnessing the Brain's Innovation Engine: How to Drive Creative Thinking **9/17/24**	**Building Connections with the Social Brain** **9/19/24**
TOPICS:	**TOPICS:**

The brain's innovation engine—the default mode network; norepinephrine, exploration, and creativity; promoting innovation; variation in innovative potential; implications for organizational structure. Creativity in brains vs. AI: how to get the best of both. **HOMEWORK:** **Read LB, Chapter 4**	**The social brain, social networks, social hierarchy, plasticity, perspective-taking, social chemicals; harnessing the social brain to manage organizational change. How to get the most out of AI by learning to be a "better human."** **HOMEWORK:** **Read LB, Chapter 1, 2**
Brains that Fire Together Wire Together: The Secrets of Team Chemistry **9/24/24**	**Topics in Neuroscience (*Guest Speaker*)** **9/26/24**
TOPICS: **Team chemistry and physiological synchrony; building synchrony through eye contact, mirroring, and social touch; applications in sports and management. Synchrony for teaming with AI.** **HOMEWORK:** **Read LB, Chapter 3; NS, Chapter 32**	**TOPICS:** **Guest Speaker, J. Brooks** **CEO and Founder of Glassview, a neuroscience based media optimization company** **HOMEWORK:** **"MEME" ASSIGNMENT 2 DUE @ 11:59PM**
The Future of Neuroscience in Business **10/1/24**	**No Class – Fall Break** **10/3/24**
TOPICS: **Ethical, legal, and societal implications of neuroscience applications to business; wearables, implantable and brain-machine interface; individual variation and human capital; AI; personality and targeted advertising** **HOMEWORK:** **Read LB, Chapter 7**	**No class! Enjoy your fall break.** **HOMEWORK:** **Finalize pitch presentations**
Brain-to-Business Final Pitch Session **10/8/22**	**Topics in Neuroscience (*Guest Speaker*)** ****UG ONLY (MBAs can attend)**** **10/10/22**
TOPICS: **A festive pitch session will conclude the course. Student teams will pitch their idea for a brain-to-business application. Prizes will be awarded.** **HOMEWORK:** **PITCH SLIDES AND WRITE UP DUE @ 11:59PM** **Study for exam**	**NOTE:** This class will be during the UG course time (1:45 PM – 3:15 PM) but MBA students are encouraged to attend. **TOPICS: Guest speaker TBD** **HOMEWORK:** **UGs Study for exam**