



Course title:	Neuroscience & Substance Use Disorders	
Course #/term:	SW 706, Winter, 2020	
Time & place:	Online – Asynchronous Format	
Credit hours:	1	
Prerequisites:	none	
Instructor:	Kathryn K. Irish, L.M.S.W., C.A.A.D.C.	
Pronouns:	She	
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	<i>You may expect a response within 24 hours</i>	
Office:	2764 SSWB	
Office hours:	Zoom group office hours will occur twice throughout the course 2/8/21 & 3/1/21 from 5-6PM; individual times are available by appointment	

1. Course Statement

a. Course description

Perhaps now more than ever, social work scientists and practitioners alike affirm the need to fully understand the variability of substance use behaviors, including substance misuse, abuse and dependence, from a multidisciplinary approach. However, the literature and practice with regard to substance use and neuroscience in the context of social work remain in its infancy. Neuroscience is concerned with better understanding brain function and structure across the lifespan, including the use of innovative methods such as functional magnetic resonance imaging. This mini-course will provide an introduction to substance use and neuroscience in the context of social work and cover topics such as the ethical and legal aspects in neuroscience, potential alterations in brain function (e.g., cognitive) and structure (e.g., D2 dopamine receptor) linked to substance use behaviors, gene x environment interaction (e.g., neurogenetics), and the developmental and cultural aspects of neuroscience. Developing a fuller understanding of the neuroscience-related mechanisms underlying substance use behaviors is promising with respect to advancing the etiology literature, which has the potential to lead to optimally efficacious and effective social work prevention and treatment programs.

b. Course content

This course presents advanced topics in interpersonal practice. The topics may include emerging practice methods, advanced application of methods covered in other required methods courses, and applications of methods in specific populations.

c. Course objectives and [CSWE competencies](#)

- Describe state-of-the-practice in addiction, especially how current practice is informed by neuroscience.
 - Including neuroimaging techniques such as: EEG, MEG, LORETA, PET, fMRI, Event-Related Optical Signal (EROS), Diffuse Optical Imaging (DOT) and Near-Infrared Spectroscopy (NIRS)
- Describe the role of the "self" and the ways in which identities, experiences, and biases shape social work research and practice.
- Describe basic concepts of philosophy, with a particular focus on epistemology, axiology and ontology.
- Apply an understanding of neuroscience concepts in social work practice through case studies:
 - Including risk assessment, levels of care determination, EBI (Harm Reduction & MAT).
- Describe the functions of the brain (neurotransmission & plasticity) the role of neuroscience in understanding the mechanisms behind addiction
- Describe gene x environment interaction.
- Understand how neuroimaging techniques measure changes in brain activity due to addiction
- Describe concepts understood through animal models in understanding the neuroscience of addiction
- Describe the application of neuroscience in the context of social work.
- Understand the neurological aspects of addiction (e.g., opioids, alcohol, sedatives, stimulants).
- Identify challenges and progress with regard to translational research-moving from animal models to human models.
- Describe current state-of-the-science regarding our understanding of the role of the brain in addiction, including the adolescent, brain, cognition, and development (ABCD) study.

d. Course design

Participants will increase their awareness with regard to their understanding of neuroscience in the context of social work and demonstrate knowledge of real-world science and practice challenges

This course uses mini lectures, guest speakers and case application/discussions/consultations to address the skills and knowledge development components of this course.

e. Intensive focus on PODS

This course integrates PODS content and skills with a special emphasis on the identification of theories, practice and/or policies that promote social justice, illuminate injustices and are consistent with scientific and professional knowledge. Through the use of a variety of instructional methods, this course will support students developing a vision of social justice, learn to recognize and reduce mechanisms that support oppression and injustice, work toward social justice processes, apply intersectionality and intercultural frameworks and strengthen critical consciousness, self-knowledge and self-awareness to facilitate PODS learning.

2. Class Requirements

a. Text and class materials

All required readings will be made available online via Canvas prior to class.

There is no required textbook. Readings will be posted in a folder for the unit, along with other course materials. It is recommended that readings are completed first, at the beginning of each unit, prior to engaging with other course materials.

Course Structure

This course is primarily asynchronous. There will be opportunities to attend live Zoom group office hours during pre-scheduled days and times; meeting information will be posted within an Announcement on Canvas. **Attending group office hours is strongly encouraged but is not required.**

Course Checklist

Students will receive a comprehensive checklist describing elements contained within each unit, to help ensure all content is reviewed in a timely manner each week. The checklist will act as a guide to the course.

Unit Materials

Class materials are posted by Unit in Canvas under “Files” and pre-recorded lectures are located under “Media Gallery” on Canvas. (Hint – if the lectures appear out of order, try displaying them alphabetically A-Z; this should put them in consecutive order.)

Each unit folder contains readings and other required course materials and activities for that unit, such as links to videos and/or websites for that unit. This information can also be found, with URLs embedded within the course checklist.

One credit hour corresponds with 37.5 hours of effort. Effort refers to the time spent working on the course, including readings, discussions, lectures, videos and course assignments, etc.

This course occurs over 5 weeks, but you will have 6 weeks total to complete all materials; therefore, you will want to plan to spend around 6.25 hours each week to complete weekly materials. Units are designed to have a balanced amount of effort; some weeks may have more than one unit. For example, if there is a lengthy video of a keynote speech or TED Talk, etc. in a given unit, there may be fewer readings, and visa-versa.

Unit Contents:

- Required Readings
- Links to Required Activities (e.g. such as interactive websites, video clips, etc.)
- Mini-Lecture Recording (20-45 min) ← Located under “media gallery”
- Brief Unit Quiz

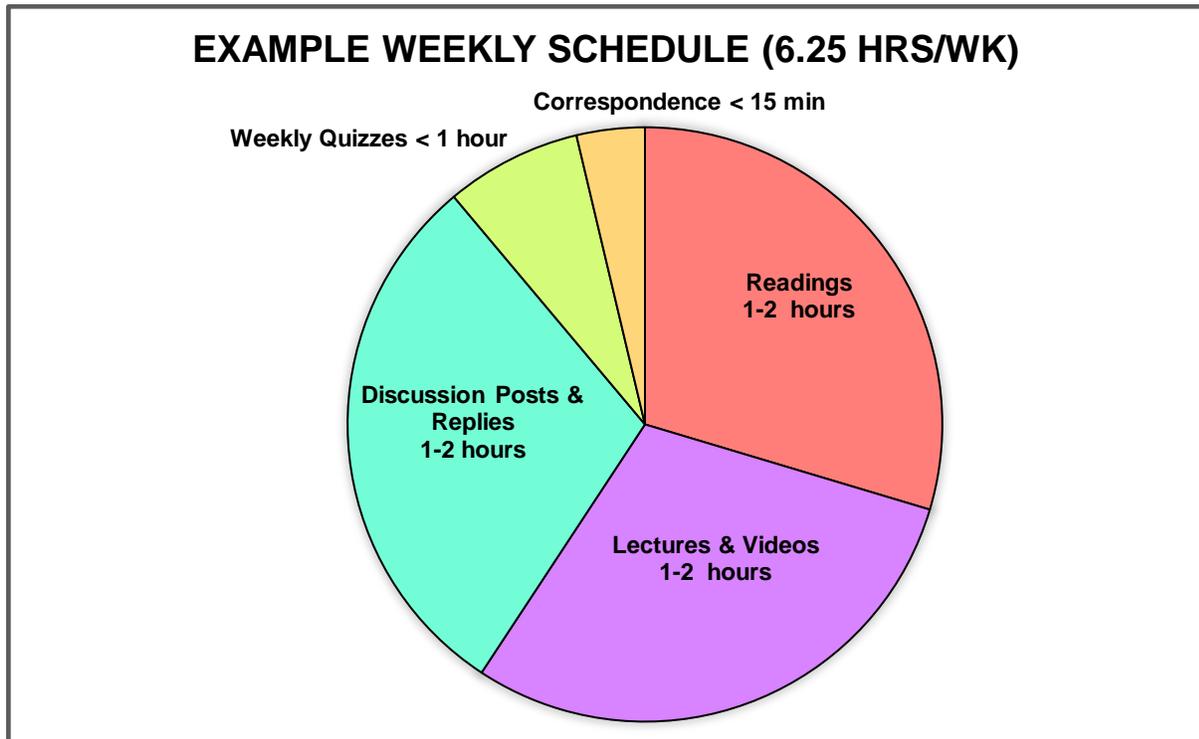


Image description: a pie chart depicting color-coded segments corresponding with time spent each week on a given task.

b. Class schedule

NOTE: The class schedule below is a general outline. Please refer to the “**Course Checklist**” (**Canvas > Files > “Course Checklist”**) for a comprehensive, week-by-week checklist of all course activities, and their locations on Canvas.

- The **!** exclamation point icon indicates there is an assignment due this week.

Week	Unit	Topic	Unit Contents	Required Readings	To-Do
Week 1 1/25/21	Unit 0	Introduction, Resources & Course Navigation	Mini-Lecture Readings Introduction Post Unit 0 Quiz	Syllabus Diamond, M., Scheibel, A., Elson, L. (1985). 1-5; 1-6, Terms of direction. <i>The human brain coloring book</i> . Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7	! Introduction Post Due Friday 1/29 ! Unit 0 Quiz Due Friday 1/29

Week	Unit	Topic	Unit Contents	Required Readings	To-Do
	Unit 1	Neuroscience + Social Work	Mini-Lecture Readings Unit 1 Quiz	<p>Flanzer, J., Gorman, E. M., & Spence, R. T. (2001). Fear of neuroscience: A dialogue about social work practice in the addictions. <i>Journal of Social Work Practice in the Addictions</i>, 1(3), 103–112. https://doi-org.proxy.lib.umich.edu/10.1300/J160v01n03_07</p> <p>Dackis, C., & O'Brien, C. (2005). Neurobiology of addiction: Treatment and public policy ramifications. <i>Nature Neuroscience</i>, 8(11), 1431–1436. https://doi-org.proxy.lib.umich.edu/10.1038/nn1105-1431</p> <p>Kwako, L. E., Momenan, R., Litten, R. Z., Koob, G. F., & Goldman, D. (2016). Addictions Neuroclinical Assessment: A Neuroscience-Based Framework for Addictive Disorders. <i>Biological psychiatry</i>, 80(3), 179–189. https://doi.org/10.1016/j.biopsych.2015.10.024</p>	Unit 1 Quiz
Week 2 2/1/21	Unit 2	Cell Anatomy & Neuronal Signal Transduction	Mini-Lecture Readings Unit 2 Quiz 2-Minute Neuroscience: The Neuron Membrane Potential Action Potential	<p>Diamond, M., Scheibel, A., Elson, L. (1985). 2-1. The neuron. <i>The human brain coloring book</i>. Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7</p> <p>Diamond, M., Scheibel, A., Elson, L. (1985). 2-7, Membrane potential. <i>The human brain coloring book</i>. Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7</p> <p>Diamond, M., Scheibel, A., Elson, L. (1985).2-8. Nerve impulse</p>	Unit 2 Quiz

Week	Unit	Topic	Unit Contents	Required Readings	To-Do
				and saltatory conduction. <i>The human brain coloring book</i> . Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7	
Week 3 2/8/21	Unit 3	ZOOM OFFICE HOURS TODAY 5-6PM Synaptic transmission + Neurotransmitters	OFFICE HOURS Mini-Lecture Readings Unit 3 Quiz 2-Minute Neuroscience: Synaptic Transmission Neurotransmitter Release GABA Glutamate Dopamine Serotonin Acetylcholine Norepinephrine	Diamond, M., Scheibel, A., Elson, L. (1985). 2-4, The synapse: structure and types. <i>The human brain coloring book</i> . Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7 Diamond, M., Scheibel, A., Elson, L. (1985).2-5, The synapse: structure and functional dynamics. <i>The human brain coloring book</i> . Collins Reference. Coloring Concepts. Harper Collins Publishers, New York. ISBN: 0-06-460306-7	Unit 3 Quiz OPTIONAL GROUP ZOOM OFFICE HOURS 5-6 PM
Week 4 2/15/21	Unit 4	Neurobiology of Addiction	Mini-Lecture Readings Unit 4 Quiz General Discussion Post 2-Minute Neuroscience: Basal Ganglia Limbic Loops VTA Nucleus Accumbens Dopaminergic Pathways	Volkow ND, Boyle M. (2018) Neuroscience of Addiction: Relevance to Prevention and Treatment. <i>Am J Psychiatry</i> . 2018;175(8):729-740. doi: 10.1176/appi.ajp.2018.17101174	! General Discussion Post Due 2/19/21 Unit 4 Quiz

Week	Unit	Topic	Unit Contents	Required Readings	To-Do
Week 5 2/22/21	Unit 5	Plasticity: The Capacity for Change	Mini-Lecture Readings Unit 5 Quiz Video Clips: Aplysia & Learning Mass Spectrometry - Aplysia	Mateos-Aparicio, P., & Rodríguez-Moreno, A. (2019). The Impact of Studying Brain Plasticity. <i>Frontiers in Cellular Neuroscience</i> , 13, 66. https://doi.org/10.3389/fncel.2019.00066 leong, H. F., & Yuan, Z. (2017). Abnormal resting-state functional connectivity in the orbitofrontal cortex of heroin users and its relationship with anxiety: a pilot fNIRS study. <i>Scientific reports</i> , 7, 46522. https://doi.org/10.1038/srep46522	Unit 5 Quiz
	Unit 6	Methods of Neuroimaging	Mini-Lecture Readings Unit 6 Quiz 2-Minute Neuroscience: Neuroimaging EEG fMRI	Fowler, J. S., Volkow, N. D., Kassed, C. A., & Chang, L. (2007). Imaging the addicted human brain. <i>Science & practice perspectives</i> , 3(2),4–16. https://doi.org/10.1151/spp07324	Unit 6 Quiz
	Unit 7	Effects of Psychoactive Substances on the Brain	Mini Lecture Readings Unit 7 Quiz 2-Minute Neuroscience **note: videos may contain realistic images of substances; if you prefer not to see this, please feel welcome to instead read the transcript of the video under “description”	Rojas, R., Riascos, R., Vargas, D. , Cuellar, H. & Borne, J. (2005). Neuroimaging in Drug and Substance Abuse Part I. <i>Topics in Magnetic Resonance Imaging</i> , 16(3), 231-238. doi: 10.1097/01.rmr.0000192156.46492.24. Borne, J., Riascos, R., Cuellar, H. , Vargas, D. & Rojas, R. (2005). Neuroimaging in Drug and Substance Abuse Part II. <i>Topics in Magnetic Resonance Imaging</i> , 16(3),	Unit 7 Quiz

Week	Unit	Topic	Unit Contents	Required Readings	To-Do
			Alcohol Cocaine Psilocybin THC Benzodiazepines Opioids Optional: Amphetamines LSD CBD	239-245. doi: 10.1097/01.rmr.0000192154.34563.6b.	
Week 6 3/1/21	Unit 8	ZOOM OFFICE HOURS TODAY 5-6PM Future Directions: Emerging Technologies & Considerations	OFFICE HOURS Unit 8 Mini-lecture Readings All Quizzes Due 3 Peer Replies Due	Jiang, L., Stocco, A., Losey, D., Abernathy, J., Prat, C., Rao, R. (2019). BrainNet: A multi-person brain-to-brain interface for direct collaboration between brains. <i>Nature</i> , 9:6115. https://doi.org/10.1038/s41598-019-41895-7	! 3 Peer Replies Due 3/1/21 ! Unit Quizzes Due 3/1/21 OPTIONAL GROUP ZOOM OFFICE HOURS 5-6PM

c. Assignments

→ **Discussion Posts (2 total)**

You will post to three discussion threads within Canvas. **You can post your response by replying within the discussion topic.** Just like in face-to-face discussions, it is important to ensure your posts are respectful and that they demonstrate a thoughtful analysis and engagement with the content. Posts must demonstrate a meaningful interaction with the unit materials in order to receive credit.

Introductory Post (1) – ! Due 1/29/21

In Canvas there is a Discussion labeled “Introductions.” Please reply to this thread and provide:

- your name & pronouns (optional)
- field placement and/or interest in this course or content

- something you hope to learn in this course

Post in General Discussion (1) – ! Due 2/19/21

In Canvas, under the discussion labeled “General Discussion” you will create a reply that will address the following:

- 3 things you learned from the unit content
- 2 potential ways in which you might apply this knowledge
- 1 question or area that you would like more information on
- Any other general thoughts, reflections or analyses

→ Discussion Replies (3 total) - ! Due 3/1/21

After posting in the General Discussion, please read through your peer’s postings in the discussion, and respond to three of them. Peer responses should be meaningful, thoughtful replies. Posts that are one sentence (e.g. “Totally agree.”) or unrelated, or otherwise unacceptable will not receive credit. If you have any questions about what is acceptable, please feel free to reach out and ask.

- Reply to 3 Peers within the General Discussion (3)

→ Unit Quizzes (7 total)

Quizzes are brief and will reflect main ideas from within the unit. They may include clinical decision making questions and/or case studies. The purpose is simply to ensure that the student has gained an understanding of the primary content from within the unit. It is strongly encouraged that Unit Quizzes are completed on a weekly basis; **quizzes for units 1-7 are due no later than 10/12/20.**

Quizzes are credit/no credit; a score of 70% or higher overall on each quiz is order to receive credit. Quizzes may be retaken as many times as necessary to achieve this score.

(1) Unit 0 – Introductory Quiz – ! Due 1/29/21

- a. *objective*: to ensure students know how to actively engage in this course, including readings, lectures, assignments and grading
 - i. Overview of course structure and information
 - ii. multiple attempts allowed – must get 100%

(5) Unit 1-7 – Unit Quizzes – ! Due 3/1/21

- b. *objective*: to ensure students have gained an understanding of the general content and concepts presented in the units
- i. Graded as-is; may re-take as many times as necessary
 - ii. 70% on each quiz is required for credit

Assignment	Due date	Grading
Introduction Discussion Post (1 post)	Introduction Discussion Post Submit on Canvas ! Due 1/29/21	Credit/No Credit
General Discussion Post (1 post)	Post in General Discussion Submit on Canvas ! Due 2/19/21	Credit/No Credit
Replies in General Discussion (3 posts)	3 Replies to Peers General Discussion Posts Submit on Canvas ! Due 3/1/21	Credit/No Credit
Introduction Quiz (1 Quiz)	Complete Introduction Quiz Canvas – Under “Quizzes” ! Due 1/29/21	Credit/No Credit Can take multiple times; 100% required for credit
Unit Quizzes (Unit 1-7 Quizzes)	Complete all Unit Quizzes Canvas – Under “Quizzes” ! Due 3/1/21	Credit/No Credit Minimum score of 70% is required for credit; can take quiz as many times as necessary to achieve this score.

This course will be credit/no credit. Students must receive credit for all assignments in order to receive credit for the course.

d. Attendance and class participation

This course is conducted in an asynchronous format. Participation will be reflected via timely completion of assignments and participation on discussion boards. **You will also have opportunities to attend live, group Zoom Office Hours twice throughout this course; attendance is strongly encouraged but is not required.**

If you are having difficulty keeping up with the content in this course, please reach out and notify me as soon as possible for accommodations.

e. Grading

Grading for this course is on a credit/no credit basis. Grades will appear as either a S (satisfactory = credit obtained) or U (unsatisfactory = credit not obtained) on transcripts. **Students must receive credit for all assignments in order to receive credit in the course.** If you need any accommodation in this course, please reach out to me as soon as possible.

[Grades in Academic Courses and in Field Instruction](#)
[Student Grievance Procedures](#)
[Policy for Grading in Special Circumstances](#)

COVID-19 Statement

For the safety of all students, faculty, and staff on campus, it is important for each of us to be mindful of safety measures that have been put in place for our protection. By returning to campus, you have acknowledged your responsibility for protecting the collective health of our community. Your participation in this course on an in-person/hybrid basis is conditional upon your adherence to all safety measures mandated by the state of Michigan and the University, including maintaining physical distancing of six feet from others, and properly wearing a face covering in class. Other applicable safety measures may be described in the [Wolverine Culture of Care](#) and the [University's Face Covering Policy for COVID-19](#). Your ability to participate in this course in-person/hybrid may be impacted by failure to comply with campus safety measures. Individuals seeking to request an accommodation related to the face covering requirement under the Americans with Disabilities Act should contact the [Office for Institutional Equity](#). If you are unable or unwilling to adhere to these safety

measures while in a face-to-face class setting, you will be required to participate on a remote basis. I also encourage you to review the [Statement of Student Rights and Responsibilities](#) and the [COVID-related Addendum to the Statement of Student Rights and Responsibilities](#).

Health-Related Class Absences

Please evaluate your own health status regularly and refrain from attending class and coming to campus if you are ill. You are encouraged to seek appropriate medical attention for treatment. School of Social Work students who miss class due to illness of any kind will be given opportunities to access course materials online or provided with alternative learning opportunities. Please notify me by email about your absence as soon as practical, so that I can make accommodations. Please note that documentation (a Doctor's note) for medical excuses is *not* required.

Recording Class

Audio and video recording of in-class lectures and discussions is prohibited without the advance written permission of the instructor. Students with an approved accommodation from the Office of Services for Students with Disabilities permitting the recording of class meetings must present documentation to the instructor in advance of any recording being done. The instructor reserves the right to disallow recording for a portion of any class time where privacy is a special concern. If the instructor chooses to record a class, they will decide which classes, if any, are recorded, what portion of each class is recorded, and whether a recording is made available on the course management website. On days when classes are recorded, students will be notified in advance that a recording will occur and be provided with an option to opt-out. Class recordings and course materials may not be reproduced, sold, published or distributed to others, in whole or in part, without the written consent of the instructor.

Additional School and University policies, information and resources are available here: <https://ssw.umich.edu/standard-policies-information-resources>. They include:

- *Safety and emergency preparedness*
- *Mental health and well-being*
- *Teaching evaluations*
- *Proper use of names and pronouns*
- *Accommodations for students with disabilities*
- *Religious/spiritual observances*
- *Military deployment*
- *Writing skills and expectations*
- *Academic integrity and plagiarism*