



Learning and the Brain

Self-Paced Course

45 Continuing Education Hours | 3 Continuing Education Graduate Credits*

About the Course Instructor



Allison Posey, MEd
[@AllisonAPosey](#)

Allison Posey, MEd, is a curriculum and design specialist at CAST and a graduate of Harvard's Mind, Brain, and Education master's program. She is the author of *Engage the Brain: How to Design for Learning that Taps into the Power of Emotion* (ASCD) and *Unlearning: Changing Your Beliefs and Your Classroom with UDL*.

Course Description

We all have brains - and this course is for anyone wanting to learn more about learning & the brain. Whether you are a teacher, administrator, museum curator, coach, parent, or you are interested in learning more about how learning and the brain are connected - this course is for you. The overarching goal is to learn more about learning and the brain, including the central role of emotions for learning. From the theories presented in this course, the goal is then for you to develop a new lens that you can apply to your practices and that you take concrete actions steps to better design for learning based on what we know about the brain. I hope this course is as much a self-reflection of your own learning as it is an opportunity to think about how you design learning experiences for others.

Course Texts

- Textbook: [Engage the Brain: How to Design for Learning That Taps into the Power of Emotion](#)
- All other materials are freely linked and can be accessed within each module

Course Objectives & Learning Outcomes

In this course, you will gain a deeper understanding of:

- The fundamentals of brain science, including understanding plasticity, variability, and how emotions are central to learning
- How to activate the brain for learning, including the role of goals and options to empower students to choose their own learning pathways
- How to design for variability, including use of Universal Design for Learning (UDL)
- How brain networks develop and the critical role of both nature & nurture
- How to captivate attention, including providing ample background understanding & expectations
- How to support memory systems, with a focus on working memory and cognitive load
- How to design for intrinsic motivation, including how to design for conditions of flow and how to incorporate a deeper language for emotions in learning

Learning Activities

Discussions



- In the weekly discussions, you will focus on the following:
 - Make connections to readings, research, and media (i.e., videos, podcasts, TED talks, and more) from the week
 - Make connections to application, such as how to change classroom practice. To build a “toolbox” of actions and steps to take to design more in line with what we know about the learning brain.
 - Make a personal connection - and represent it through some kind of growing concept map
- Discussions are important to your learning and help you form a community, connect, and learn with your peers. While your responses will not be graded, we highly encourage you to participate by responding to at least two of the discussion questions and interacting with your classmates.



Self-Assessment


- At the end of each module, there is a self-assessment, or a chance for you to bring the theory you are learning “to life” in your practice. The formative assessments focus on one of two projects that you will continue to build and design throughout the course:
 - **Brain module:** based on what you are learning within each section of the course, you will create a brain module that you can teach to someone else. You will include key

- information about the learning brain that you think is critical for others to know (such as students, teachers, parents, or others!).
- **Lesson design:** based on what you are learning with the module, you will take an existing lesson (such as a remote learning experience, activity, lesson, museum exhibit, staff meeting, or any other activity) and re-design the lesson based on what you are learning about the learning brain.
 - In addition, each week you will continue to **build your own course concept map** - or representation of what you are learning. It could be on Post-It notes, doodled in pictures, bulleted outlines - or any way you are recording what you are learning.

Course Modules

MODULE	Topics
	<p>Module 1: Neuroscience and Teaching</p> <p>Objectives</p> <ul style="list-style-type: none"> ● To understand 3 key facts about the brain: variability, plasticity, emotions are central to learning. ● To begin to develop a brain module you can share with others by the end of the course about key ideas about the learning brain. <p>Activities</p> <ul style="list-style-type: none"> ● Read the Introduction (p. 1-8) of <i>Engage the Brain</i> ● Deepen your knowledge with resources ● Discussion: Respond to at least two questions using any means that you like ● Self-assessment: Reflect on your own learning & share these key brain ideas with someone: any means!
	<p>Module 2: Activate the Brain for Learning</p> <p>Objectives</p> <ul style="list-style-type: none"> ● To understand how the brain makes predictions based on previous experiences - and that this activates physiology. ● To understand how we need activation for learning, but too much leads to stress or anxiety and not enough leads to boredom or apathy. ● To design for learning using a clear goal and to offer flexible pathways to help activate the brain for learning. ● To analyze an existing lesson, activity, meeting, or other learning experience through the lens of engagement and the

	<p>brain. You will continue to build on this lesson throughout the course.</p> <p>Activities</p> <ul style="list-style-type: none"> ● Read or listen to <i>Chapter 1: Engage the Brain, Activate Learning</i> ● Deepen your knowledge with resources ● Discussion: Respond to at least two questions using any means that you like ● Self-assessment: Choose a learning experience. Analyze goal, flexibility, engagement, and “tigers” that may be in the experience.
	<p>Module 3: Design for Variability</p> <p>Objectives</p> <ul style="list-style-type: none"> ● To understand more about predictable variability in the nervous system across recognition, strategic, emotion networks. ● To learn about Universal Design for Learning as a tool to anticipate systematic variability. ● To reflect on how you can design learning experiences to meet the wide range of learning needs - knowing there will be variability. ● To continue to build on your formative assessment. <p>Activities</p> <ul style="list-style-type: none"> ● Read or listen to <i>Chapter 2: Engage the Brain, Design for Variability</i> ● Deepen your knowledge with resources ● Discussion: Respond to at least two questions using any means that you like ● Self-assessment: Return to your learning experience. Analyze barriers and add 1 option for Engagement, Representation, and Action & Expression.
	<p>Module 4: Foster the Development of Brain Networks</p> <p>Objectives</p> <ul style="list-style-type: none"> ● To understand how variability and plasticity are new ways for thinking about the brain that extend beyond old ways of labeling learning styles or right/left brain thinkers. ● To understand how both active and reflective time is critical learning - and that we need to design for both in our lessons.

	<ul style="list-style-type: none"> ● To reflect on how our brains and genetics are influenced by a combination of nature and nurture. Our neurobiology is constructed based on our interactions with the environment. ● To continue to build on your formative assessment. <p>Activities</p> <ul style="list-style-type: none"> ● Read or listen to <i>Chapter 3: Engage the Brain, Foster the Development of Brain Networks</i> ● Deepen your knowledge with resources ● Discussion: Respond to at least two questions using any means that you like ● Self-assessment: Return to your module 1 assignment: teach someone about variability, plasticity, emotions for learning + what you have learned
	<p>Module 5: Captivate Attention</p> <p>Objectives</p> <ul style="list-style-type: none"> ● To understand that emotions drive perception, perception is not a “one way” street from the environment to the brain. ● To experience examples that highlight how critical background experiences and expectation are for directing attention. ● To know that the context matters for how students demonstrate and build their learning: High expectations (WISE feedback) and mastery oriented feedback are critical for supporting students’ perceptions of ability and their emotions for learning. ● To recognize how both novelty and routine are important parts of our teaching. ● To continue to build on your formative assessment. <p>Activities</p> <ul style="list-style-type: none"> ● Read or listen to <i>Chapter 4: Engage the Brain, Captivate Attention</i> ● Deepen your knowledge with resources ● Discussion: Respond to at least two questions using any means that you like ● Self-assessment: Focus on how you give WISE and mastery-oriented feedback during a learning experience to promote high expectations of the goal.

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Module 6: Scaffold Memory

Objectives

- To understand how memory is important for learning and there is variability in our students' ability to hold information in mind.
- To analyze working memory in order to deepen understanding of how different strategies work to support meaningful memory formation.
- To reflect on how our design scaffolds to reduce cognitive load.
- To continue to build on your formative assessment.

Activities

- Read or listen to *Chapter 5: Engage the Brain, Scaffold Memory*
- Deepen your knowledge with resources
- Discussion: Respond to at least two questions using any means that you like
- Self-assessment: Memorize something! Meta-reflection on strategies and design.

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Module 7: Intrinsically Motivate

Objectives

- To learn about the state of flow, or those moments when we lose track of what is going on around us because we are so engaged in what we are doing.
- To support students to experience flow in their learning
- To learn how self-determination theory can guide lesson design for learning that support intrinsic motivation
- To learn how to support students to better communicate about their emotions for learning
- To continue to build on your formative assessment.

Activities

- Read or listen to *Chapter 6: Engage the Brain, Intrinsically Motivate to gain an overview of the topics in this section*
- Deepen your knowledge with resources
- Discussion: Respond to at least two questions using any means that you like
- Self-assessment: Analyze a lesson for flow OR develop your own Mood Meter



Module 8: Support Emotions for Teaching

Objectives

- To reflect on how teaching is emotional work, not about delivering content.
- To use the theories presented so far in the course to analyze how school routines and systems support teacher engagement and learning
- To develop strategies to support your own emotions and learning in the workplace
- To continue to build on your formative assessment.

Activities

- Read or listen to *Chapter 7: Engage the Brain, Support the Emotion of Teaching*
- Deepen your knowledge with resources
- Discussion: Respond to at least two questions using any means that you like
- Self-assessment: Reflect on your teaching environment and suggest strategies to reduce your barriers - to support your emotions for teaching.



Module 9: Make Broader Connections

Objectives

- To take time to deepen your understanding about the learning brain.
- To return to your goals for taking this course and take time this week to learn something new about the learning brain (i.e., learn more about stress, sleep, anxiety, dyslexia, autism, etc.)
- To take your two formative assessments that you developed throughout the course and prepare them for a final summative project- where you share your Brain Module and Lesson Re-design with others in the class.

Activities

- Deepen your knowledge with resources
- Discussion: Respond to at least two questions using any means that you like
- Self-assessment: Start to prepare for the summative project. Annotate your concept map and lesson plan.

Module 10: Final Reflection

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Objectives

- Complete and share your two cumulative assignments with others in the course, including:
 - Your annotated lesson plan with redesigned elements and strategies highlighted & connected to your learning
 - Your Brain module with the key ideas you learned that you can teach/share with others to learn about the learning brain

Activities

- Share your lesson plan and concept map in any means that works best for you: Rubric, video, written, Powerpoint, or other.
- Sharing is optional but highly recommended!

**With additional registration and fee*