# Course Description

A re-examination of programs and services for diverse learners from the viewpoint of cognitive neuroscience of learning. Viewing learning as essentially a process of neurological change, neurological research about learning offers practitioners and policy-makers insights and perspectives to change educational practice.

# University Learning Outcomes (ULO)

* **ULO1:** Knowledge of Human Cultures and the Physical and Natural World
* **ULO2**: Intellectual and Practical Skills
* **ULO3**: Personal and Social Responsibility
* **ULO4**: Integrative and Applied Learning
* **ULO5:** Immersed in the Critical Concerns of the Sisters of Mercy of the Americas

# Program Learning Outcomes (PLO)

* **PLO1:** Articulate an educational organization's mission, goals, and guiding principles that distinguish the organization from others. (ULO1, 4)
* **PLO2:** Understand the foundational base of organizational theory, and demonstrate the ability to bridge theory and practice. (ULO1, 2, 4)
* **PLO3:** Given scenarios of conflict, choose ethical courses of action consistent with Gospel values. (ULO3, 5)
* **PLO4:** Synthesize and analyze data to reveal relations and causality, and convert raw data into actionable information. (ULO2, 4)
* **PLO5:** View problems and challenges through the lens of a scientist, seeking evidence-based conclusions. (ULO1, 2, 4)
* **PLO6:** Practice and model steward leadership in transforming organizations to better serve all constituents. (ULO3, 4, 5)
* **PLO7:** Demonstrate facility in the application of technology to solve problems, analyze and synthesize data, and manage information. (ULO1, 2, 4)

# Course Learning Outcomes (CLO)

* **CLO1:** Explain the impact of neuroscience on pedagogy.
* **CLO2:** Analyze the potential of brain research to support classroom practice/pedagogy and student learning.
* **CLO3:** Utilize brain research to implement school-based change/reform.

# Student Expectations

Students are expected to:

* Ask probing and insightful questions related to course content.
* Make meaningful and relevant connections and application to their own learning process.
* Be productive and contributing members of class discussions.

# Required Course Materials

Sousa, D. (2010). Mind, Brain & Education*: Neuroscience Implications for the Classroom.* Bloomington, IN: Solution Tree Press.

Gregory, G., & Kaufeldt, M. (2015). The Motivated Brain: *Improving Student Attention, Engagement, and Perseverance*. Alexandria, VA: ASCD.

# Suggested Point Values

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| --- | --- | --- |
| **Assessment** | **Point Value** | **Due** |
| **Week 1** |  |  |
| Discussion: Impact of Early Revelations of Brain Research | 50 |  |
| Discussion: Neuromyths | 50 |  |
| Journal: Mind, Brain, and Education Principles | 50 |  |
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| **Week 2** |  |  |
| Discussion: Impacts on Student Learning | 50 |  |
| Discussion: Neuroplasticity | 50 |  |
| Presentation: Professional Practice and Pedagogy | 50 |  |
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| **Week 3** |  |  |
| Discussion: The Brain: Emotion and Learning | 50 |  |
| Discussion: Activating the Primary SEEKING System | 50 |  |
| Concept Paper: Neuroscience Explained | 75 |  |
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| **Week 4** |  |  |
| Discussion: Reading Brain | 50 |  |
| Presentation: Neuroscience Action Plan | 50 |  |
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| **Week 5** |  |  |
| Discussion: Math Brain | 50 |  |
| Presentation: Neuroscience Action Plan | 50 |  |
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| **Week 6** |  |  |
| Discussion: Brain Targeted Teaching Model | 50 |  |
| Discussion: Growth Mindset | 50 |  |
| Concept Paper: Neuroscience Explained | 75 |  |
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| **Week 7** |  |  |
| Discussion: Potential Impact of Neuroscience on Education | 50 |  |
| Action Plan: Educational Neuroscience | 100 |  |
|  |  |  |
| **Total Points** | **1000** |  |

# Course Schedule

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| --- | --- | --- |
| **Week** | **Start** | **End** |
| One |  |  |
| Two |  |  |
| Three |  |  |
| Four |  |  |
| Five |  |  |
| Six |  |  |
| Seven |  |  |

# Weekly Learning Modules

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| **Week One: Introduction to “Neuroeducation” or “Educational Neuroscience”** | | | |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Summarize the history of brain research and neuroimaging tools that have led to new discoveries about the brain. | | CLO1 | |
| * 1. Evaluate the possible impact of early revelations of brain research on teaching and learning. | | CLO1, CLO2 | |
| * 1. Analyze common “neuromyths.” | | CLO1, CLO2 | |
| * 1. Analyze the impact of the “Mind, Brain and Education” principles on teaching and learning. | | CLO1, CLO2 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Tutorials**  During this course you will be asked to use and participate in various technologies to complete activities and assignments.  **Review** the tutorials available on Blackboard as needed.  **Click** the **Student Resources** button from the menu on the left. | | N/A | N/A |
| **Weekly Participation and Discussion**  The purpose of the weekly discussions is to provide you with a way to synthesize the concepts presented in this course. Each week, you will respond to the discussion questions with a substantive post of 200-to 250-words that addresses all the prompts for the question by 11:59 p.m. EST of the listed due date. By the conclusion of each week, Sunday at 11:59 p.m. EST, you will make at least one substantive comment of 100-to 150-words to three of your classmates’ posts for each assigned discussion question. Your comments must further the discussion by following the RISE Model for meaningful feedback. It is recommended that you check in periodically throughout the week to ensure that you are meeting the participation requirement.  **Review** the [RISE Model for Peer Feedback](http://elwray.squarespace.com/feedback). | | N/A | N/A |
| **Week One Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Introduction (pp. 1 – 7) * Chapter 1: How Science Met Pedagogy (pp. 8 – 25) * Chapter 2: Neuroimaging Tools and the Evolution of Educational Neuroscience (pp. 26 – 43)   **Post** any comments and questions to the Week One General Discussion. | | 1.1, 1.2, 1.4 | Discussion board: Comments and questions =  **1 hour** |
| **Resources: Mind, Brain, Education Science**  Dr. Tracey Tokuhama-Espinosa is a researcher and Harvard professor who has written extensively on the topic of brain science, specifically on the topic of neurobiology and learning. The following resources, one of Dr. Tokuhama-Espinosa’s articles and one of her lectures, will give you crucial insight into neurobiology and neuromyths.  **Read “**Why Mind, Brain, and Education Science is the ‘New’ Brain-Based Education,” available on Johns Hopkins School of Education website: <http://education.jhu.edu/PD/newhorizons/Journals/Winter2011/Tokuhama1>  **View** “Neuromyths: Common False Beliefs About the Brain and Learning,” [1:37:17]  <https://drive.google.com/a/nhsd.org/file/d/0B8RaPiQPEZ9ZV2w0d3ZMWGF1VUk/view>  **Post** any comments and questions to the Week One General Discussion. | | 1.1, 1.2, 1.3, 1.4 | Discussion board: Comments and questions =  **2 hours** |
| **Upcoming Assignment: Action Plan: School-Wide Educational Neuroscience**  In this course, you’re going to learn about how neuroscience is changing and has changed our understanding and practice of education, teaching, and learning. Much of the course will involve you synthesizing the information you learn into practical applications and presentations, and the Week Seven Action Plan will be no different.  In Week Seven, you will create an action plan for improving the teaching and learning at an educational environment of your choice.  **Include** the following components in your action plan:   * Description of the neuroscience behind each aspect of your action plan * Actionable ideas based on neuroscience for improving teaching and learning in the school environment you’ve chosen * Assessment system for tracking progress (i.e., how will you know that your interventions are effective?)   **Review** the Action Plan Planning Template.  Note. This template is designed to help you plan your action plan and interventions. It is not a substitute for a fully fleshed out and detailed action plan intervention. Your final submission should include justification for each of your interventions and a description of how the intervention is based on neuroscience.  Your Action Plan is due in ***WEEK SEVEN***. | | 7.1 |  |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Adobe Connect Live Discussion**  **Review** [Adobe Connect Resources](https://sites.gmercyu.edu/student-resources/adobe-connect-resources/).  **Participate** in the scheduled live session with the course instructor. This session will provide an overview of the class and discuss the major assignments in the course.  **Prepare** to ask questions concerning the content of the week and the course as a whole.  Note: A recorded lecture will be made available to those who are unable to attend the live session. | | n/a | Live Discussion: lecture and discussion = **1 hour** |
| **Resource: The Scientifically Substantiated Art of Teaching by Dr. Tracey Tokuhama-Espinosa**  The PDF resource is a 107 slide presentation from Dr. Tracey Tokuhama-Espinosa on the subject of teaching using methods supported by science.  **Review** [*The Scientifically Substantiated Art of Teaching*](https://drive.google.com/file/d/0B2eJxDQxPEwxSzFuY293ZzFWelk/view?usp=sharing)*.*  **Post** any comments and questions to the Week One General Discussion. | | 1.1, 1.2, 1.3 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Impact of Early Revelations of Brain Research**  **Respond** to the following question in the “Impact of Early Revelations of Brain Research” discussion forum by Thursday:   * In what ways did early brain research influence the practice of teaching and learning?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 1.1, 1.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Discussion: Neuromyths**  **Read “**Neuro Myths: Separating Fact and Fiction in Brain-Based Learning,” available on Edutopia:<http://www.edutopia.org/neuroscience-brain-based-learning-myth-busting>. Read “The High Cost of Neuromyths in Education,” available on Edutopia: <http://www.edutopia.org/blog/high-costs-neuromyths-in-education-judy-willis> **Review** Tracey Tokuhama’s lecture video *Neuromyths.*  **Respond** to the following question in the “Neuromyths” discussion forum by Thursday:   * What are some common neuromyths that were highlighted? * Why do you think these myths persist? * How can you use this information to support teaching and learning?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 1.3 | Discussion: one post and replies to three other posts = **1 hour** |
| **Journal: Mind, Brain, and Education Principles**  **Review** the following two resources on natural learning principles, available from Caine Learning:   * The Caines’ Brain/Mind Principles of Natural Learning: <http://www.cainelearning.com/brain-mind-principles/> * 12 Brain/Mind Natural Learning Principals: <http://www.cainelearning.com/wp-content/uploads/2014/04/12-Brainmind-principles-expanded.pdf>   **Review** “What Mind, Brain, and Education (MBE) Can Do for Teaching,” available on Johns Hopkins School of Education website, specifically the material under the heading “The Five Well-Established Concepts of MBE Science”: <http://education.jhu.edu/PD/newhorizons/Journals/Winter2011/Tokuhama2>.  **Write** a 250- to 400-word journal in which you respond to the following:   * Compare and contrast the researcher’s ideas as they relate to Mind, Brain, and Education. * Select and explain which of these principles can be translated into your own professional practice. If there are principles that do not seem to apply to your professional practice, explain why.   **Submit** your assignment to your instructor via Blackboard no later than 11:59 p.m. (EST) on Sunday. | | 1.4 | Journal=  **30 minutes** |
| **Total** |  |  | **2 hours, 30 minutes** |

# Faculty Notes

**Adobe Connect:** Students should post any questions or comments they have to the Announcement forum. The instructor can then utilize those questions that come up in the first part of the week to tailor the live Adobe Connect class session that would be scheduled toward the later part of the week. That 1-hour synchronous session will allow students the opportunity to go over any questions they had with the homework and clarify any misconceptions they have about the course content. All Adobe Connect sessions should be recorded and a link to the recording be posted to the course page so any student who misses the session can review it later in the week.

*Note:* It is the instructor’s choice as to what day they will schedule the Adobe Connect Live Session, but it is recommended that they schedule this session for Wednesday of the week so students have plenty of time to review their homework prior to the deadline on Sunday.

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| Week Two: Neuroscience and its Impact on Learning and Motivation | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Explain the impact of the Reticular Activating System (RAS), the Pre-Frontal Cortex (PFC), and dopamine in teaching and learning. | | CLO1 | |
| * 1. Examine neuroplasticity and its importance in education. | | CLO1 | |
| * 1. Analyze the impact and effects of motivation on student learning. | | CLO1, CLO2 | |
| * 1. Describe how the SEEKING system can be utilized in your school or district. | | CLO2 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Two Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 3: The Current Impact of Neuroscience on Teaching and Learning (pp. 44 – 67)   **Read** the following chapters in*The Motivated Brain* (Gregory & Kaufeldt):   * Introduction (pp. 1 – 8) * Chapter 1: The Challenge of Motivating Students (pp. 9 – 31) * Chapter 2: The Science of Motivation: The SEEKING System (pp. 32 – 48)   **Post** any comments and questions to the Week Two General Discussion. | | 2.1, 2.2, 2.3, 2.4 | Discussion board: Comments and questions =  **2 hour** |
| **Resource: Barbara Arrowsmith Young: The Woman Who Changed Her Brain**  Barbara Arrowsmith is an educator and author who had severe learning disabilities as a child. After working through college and an advanced degree, she worked with other researchers on neuroplasticity to develop a series of brain exercises that she says have allowed her to train her brain and end her learning disabilities.  **View** “The Woman Who Changed her Brain,” available from the TEDx website [13:56]:  <http://tedxtalks.ted.com/video/The-Woman-Who-Changed-Her-Brain>  **Post** any comments and questions to the Week Two General Discussion. | | 2.2 | Discussion board: Comments and questions =  **30 minutes** |
| Resource: “A Neurologist Makes the Case for Teaching Teachers About the Brain,” by Dr. Judy Willis Neurologist, author, and teacher Dr. Judy Willis argues for allocating resources to teach teachers about neuroscience and how it could improve the practice of teaching.  **Read “**A Neurologist Makes the Case for Teaching Teachers About the Brain,” available on Edutopia:<http://www.edutopia.org/blog/neuroscience-higher-ed-judy-willis>.  **Post** any comments and questions to the Week Two General Discussion. | | 2.3 | Discussion board: Comments and questions =  **30 minutes** |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Resource: All in the Mind- Interview with Dr. Norman Doidge on Neuroplasticity**  **Listen** to *All in the Mind’s* interview of Dr. Norman Doidge on neuroplasticity [28:50]: <http://mpegmedia.abc.net.au/rn/podcast/2015/04/aim_20150419.mp3> | | 2.2 |  |
| **Resource: Making Classrooms Better by Dr. Tracey Tokuhama-Espinosa**  The PDF resource is a 119 slide presentation from Dr. Tracey Tokuhama-Espinosa on the subject of changing classroom practice by incorporating brain- and science-based teaching techniques.  **Review** [*Making Classrooms Better*](https://drive.google.com/file/d/0B2eJxDQxPEwxa3c5NFI3cWUwSVU/view?pref=2&pli=1)*.*  **Post** any comments and questions to the Week Two General Discussion. | | 2.3 |  |
| **Video: All in the Mind? The Role of Neuroscience in Education**  **View** “All in the Mind? The Role of Neuroscience in Education,” available from Euronews [10:29]: <http://www.euronews.com/2014/11/14/all-in-the-mind-the-role-of-neuroscience-in-education>  **Post** any comments and questions to the Week Two General Discussion. | | 2.3 |  |
| **Video:** **After Watching This, Your Brain Will Not Be the Same | Lara Boyd | TEDxVancouver**  **View** “After watching this, your brain will not be the same | Lara Boyd | TEDxVancouver,” available on YouTube [14:24]: <https://www.youtube.com/watch?v=LNHBMFCzznE>  **Post** any comments and questions to the Week Two General Discussion. | | 2.2 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Impacts on Student Learning**  **Review** the instructional strategies that utilize the neuroscience concepts presented in *Mind, Brain, and Education*.  **Respond** to the following prompt in the “Impacts on Student Learning**”** discussion forum by Thursday:   * Explain the instructional strategies covered in this week’s reading and resources that can have the most impact in teaching and learning, using the lens of special education when crafting your response.   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 2.1, 2.2, 2.3, 2.4 | Discussion: one post and replies to three other posts = **1 hour** |
| **Discussion: Neuroplasticity**  Both texts discuss the notion of neuroplasticity and its applicability to education.  **Respond** to the following prompt in the “Neuroplasticity” discussion forum by Thursday.   * Explain how the idea of neuroplasticity is relevant to the realm of special education. Provide concrete examples.   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 2.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Presentation: Professional Practice and Pedagogy**  **Create** a 5- to 7-slide presentation that explains the following:   * A particular fact, study, or inference about brain science (explained at the level of a layperson) * An explanation of how that brain science can be used in teaching and learning practice * Specific examples of the use of that science to improve teaching and learning * Takeaways that school staff could use in their planning and practice   **Include** detailed speakers notes for each slide of the presentation.  **Submit** your presentation materials to your instructor by 11:59 p.m. (EST) on Thursday.  **Review** the presentations of each of your classmates.  **Post** comments, observations, and other meaningful feedback to at least three of your classmate’s presentations no later than 11:59 p.m. (EST) on Sunday. | | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2. 2.3. 2.4 | Presentation: Research, presentation, and feedback =  **2 hours** |
| **Total** |  |  | **4 hours** |

# Faculty Notes

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| Week Three: Social and Emotional Learning | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Explain the influence of social and affective neuroscience on teaching and learning. | | CLO1, CLO2 | |
| * 1. Assess the importance of the duality of emotion and cognition on student learning. | | CLO1, CLO2 | |
| * 1. Describe the conditions that facilitate social and emotional learning in a school and classroom. | | CLO1, CLO2, CLO3 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Three Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 4: The Role of Emotion and Skilled Intuition in Learning (pp. 68 – 83)   **Read** the following chapters in*The Motivated Brain* (Gregory & Kaufeldt):   * Chapter 3: Exploratory Investigations: Level 1 – The Need to SEEK (pp. 49 – 71) * Chapter 4: Learning and Anticipation: Level 2 – SEEKING and Making Connections (pp.72 – 92)   **Post** any comments and questions to the Week Three General Discussion. | | 3.1, 3.2, 3.3 | Discussion board: Comments and questions =  **1 hour** |
| **Resources: The Motivated Brain: Using the SEEKING System to Improve Student Attention, Engagement, and Perseverance**  **Review** “The Motivated Brain: Using the SEEKING System to Improve Student Attention, Engagement, and Perseverance” [handout](http://dmfa3ba8wpnh6.cloudfront.net/9c/fd/5b479f5644209630ead676fe56c4/the-motivated-brain-handouts-ascd-webinar.pdf), available from the ASCD.  **Watch** “The Motivated Brain” webinar, also available from the ASCD [59:38]: <http://bcove.me/uuthin09>  **Post** any comments and questions to the Week Three General Discussion. | | 2.4, 3.1, 3.2, 3.3 | Discussion board: Comments and questions =  **1 hour, 30 minutes** |
| **Resource: The Relevance of Social and Affective Neuroscience to Education**  Professor Mary Helen Immordino-Yang discusses the importance of making learning both meaningful and relevant to real life practice by encouraging students to own their learning.  **View**  “The Importance of Emotionally Meaningful Learning,” available from the Science Network [61:47]:  <http://thesciencenetwork.org/programs/tdlc-all-hands-meeting-2014/embodied-brains-social-minds-the-relevance-of-affective-and-social-neuroscience-to-education>  **Post** any comments and questions to the Week Four General Discussion. | | 3.1, 3.2, 3.3 | Discussion board: Comments and questions =  **30 minutes** |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: The Brain: Emotion and Learning**  **Respond** to the following question in the “The Brain: Emotion and Learning**”** discussion forum by Thursday:   * How are emotion and cognition connected? * How does emotion impact student learning? * What instructional strategies can bring emotions into the classroom? How would these techniques impact student learning?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 3.1, 3.2, 3.3 | Discussion: one post and replies to three other posts = **1 hour** |
| **Discussion: Activating the Primary SEEKING System**  Gregory and Kaufeldt list a variety of ways to activate the “primary SEEKING system” beginning on page 53 of *The Motivated Brain*.  **Review** the various conditions for activating the primary SEEKING system.  **Respond** to the following question in the “Activating the Primary SEEKING System” discussion by Thursday.   * Which of these conditions could have the most impact on a school/classroom environment? Justify your response and include concrete examples.   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 2.4, 3.1, 3.2, 3.3 | Discussion: one post and replies to three other posts = **1 hour** |
| **Concept Paper: Neuroscience Explained**  **Write** a 1,050- to 1,750-word research paper about a neuroscience topic of your choice from the course so far (Weeks 1-3) that accomplishes the following:   * Analyzes the current scientific attitude/findings toward the topic * Explains why the neuroscience could be valuable in a teaching and learning context * Describes why you personally find this information useful or relevant   **Include** relevant APA citations with your paper.  **Submit** this assignment to your instructor via Blackboard no later than 11:59 p.m. (EST) on Sunday. | | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3 | Research paper =  **1 hour** |
| **Total** |  |  | **3 hours** |

# Faculty Notes

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| Week Four: Brain Research: Literacy | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Analyze the influence of brain research on speech and language and its implications for teaching and learning. | | CLO1, CLO2 | |
| * 1. Design an action plan for how brain research can positively influence the teaching and learning of reading for students with learning disabilities. | | CLO1, CLO2, CLO3 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Four Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 5: The Speaking Brain (pp. 85- 109) * Chapter 6: The Reading Brain (pp. 110 – 137) * Chapter 7: Constructing a Reading Brain (pp. 138 – 161)   **Post** any comments and questions to the Week Four General Discussion. | | 4.1, 4.2 | Discussion board: Comments and questions =  **1 hour, 30 minutes** |
| **Article: Neuroscience, Education, and Special Education, by Usha Goswami**  **Read** “[Neuroscience, Education, and Special Education](https://drive.google.com/file/d/0B2eJxDQxPEwxU0hmY08tLUI3dDA/view?pref=2&pli=1),” by Usha Goswami.  **Post** any comments and questions to the Week Four General Discussion. | | 4.1, 4.2 | Discussion board: Comments and questions =  **30 minutes** |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Resources: Neuroscience of Reading**  **Review** the following resources on the neuroscience of reading:   * [Neuroscience of Reading and Dyslexia](https://www.youtube.com/playlist?list=PLRw26d3B0rX6Bgtejpn6i_loNQXGYQWh1) – Video series by Carol Whitney * [Your Brain on Fiction](http://www.nytimes.com/2012/03/18/opinion/sunday/the-neuroscience-of-your-brain-on-fiction.html?_r=0) by Annie Murphy Paul from the New York Times * [How Children Learn to Read](http://www.newyorker.com/science/maria-konnikova/how-children-learn-read) by Marla Konnikova from The New Yorker. | | 4.1, 4.2 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Reading Brain**  A brain that can read has remarkable plasticity and complexity. A number of systems need to be developed and connected and practice and experience must focus on all of these systems in order to create a brain that can read.  **Respond** to the following question in the “Reading Brain**”** discussion forum by Thursday:   * Using the information discussed in Chapters 5, 6, and 7 of *Mind, Brain, and Education*, analyze the impact that brain research has on the teaching and learning of reading. As an educational leader, what information is critically important in supporting ALL students to read, especially those with reading difficulties?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 4.1, 4.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Presentation: Neuroscience Action Plan**  **Create** a 5- to 7-slide presentation that explains the following:   * A brief action plan in using brain research to support the teaching and learning of reading. * An explanation of how that brain science can be used in teaching and learning practice. * Specific examples of the use of that science to improve teaching and learning of reading. * Takeaways that school staff could use in their planning and practice of teaching reading.   **Include** detailed speakers notes for each slide of the presentation.  **Submit** your presentation materials to your instructor by 11:59 p.m. (EST) on Thursday.  **Review** the presentations of each of your classmates.  **Post** comments, observations, and other meaningful feedback to at least three of your classmate’s presentations no later than 11:59 p.m. (EST) on Sunday. | | 4.1, 4.2 | Presentation: Research, presentation, and feedback =  **2 hours** |
| **Total** |  |  | **3 hours** |

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| Week Five: Brain Research: Mathematics | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Analyze the influence of brain research on mathematics and its implications for teaching and learning. | | CLO1, CLO2 | |
| * 1. Design an action plan for how brain research can positively influence the teaching and learning of mathematics for students with learning disabilities. | | CLO1, CLO2, CLO3 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Five Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 8: The Mathematical Brain (pp. 162- 177) * Chapter 9: The Calculating Brain (pp. 178 – 199) * Chapter 10: The Computing Brain (pp. 200 – 225)   **Post** any comments and questions to the Week Five General Discussion. | | 5.1, 5.2 | Discussion board: Comments and questions =  **2 hours** |
| **Upcoming Assignment: Action Plan: School-Wide Educational Neuroscience**  In Week Seven, you will be responsible for creating an education-based action plan for improving the teaching and learning at the school of your choice.  **Include** the following components in your action plan:   * Description of the neuroscience behind each aspect of your action plan * Actionable ideas based on neuroscience for improving teaching and learning in the school environment you’ve chosen * Assessment system for tracking progress (i.e., how will you know that your interventions are effective?)   *Note*. This assignment is due in WEEK SEVEN. | |  |  |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Article: Neuroscience, Education, and Special Education, by Usha Goswami**  **Review** “[Neuroscience, Education, and Special Education](https://drive.google.com/file/d/0B2eJxDQxPEwxU0hmY08tLUI3dDA/view?pref=2&pli=1),” by Usha Goswami.  **Post** any comments and questions to the Week Five General Discussion. | | 5.1, 5.2 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Math Brain**  Basic numerical and mathematical skills are essential for navigating our everyday lives and have been shown to be critical determinants of professional success.  **Respond** to the following question in the “Math Brain**”** discussion forum by Thursday:   * Using the information discussed in Chapters 8, 9, and 10, analyze the impact that brain research has on the teaching and learning of mathematics. As an educational leader, what information is critically important in supporting ALL students to be mathematically proficient, especially those with learning difficulties.   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 5.1, 5.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Presentation: Neuroscience Action Plan**  **Create** a 5- to 7-slide presentation that explains the following:   * A brief action plan in using brain research to support the teaching and learning of mathematics. * An explanation of how that brain science can be used in teaching and learning practice. * Specific examples of the use of that science to improve teaching and learning of mathematics. * Takeaways that school staff could use in their planning and practice of teaching mathematics.   **Include** detailed speakers notes for each slide of the presentation.  **Submit** your presentation materials to your instructor by 11:59 p.m. (EST) on Thursday.  **Review** the presentations of each of your classmates.  **Post** comments, observations, and other meaningful feedback to at least three of your classmate’s presentations no later than 11:59 p.m. (EST) on Sunday. | | 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 4.1, 4.2, 5.1, 5.2 | Presentation: Research, presentation, and feedback =  **2 hours** |
| **Total** |  |  | **3 hours** |

# Faculty Notes

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| Week Six: Growth Mindset, Creativity, and Metacognition | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Interpret Carol Dweck’s concept of “Growth Mindset” in an educational context. | | CLO1, CLO2, CLO3 | |
| * 1. Assess the brain-targeted teaching model and its use in schools to enhance an arts-integrated curriculum. | | CLO1, CLO2, CLO3 | |
| * 1. Analyze the use of metacognition to support student thinking and learning. | | CLO1, CLO2, CLO3 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Six Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 11: The Creative-Artistic Brain (pp. 227 - 246)   **Read** the following chapters in*The Motivated Brain* (Gregory & Kaufeldt):   * Chapter 5: Imagination and Synthesis: Level 3 – Applying Higher Cognitive Processing (pp. 93 – 122)   **Post** any comments and questions to the Week Six General Discussion. | | 6.1, 6.2, 6.3 | Discussion board: Comments and questions =  **1 hour, 30 minutes** |
| **Resource: Webinar – Teaching Students to Drive Their Brains**  **Navigate** to <http://www.ascd.org/professional-development/webinars/teaching-students-to-drive-their-brains-webinar.aspx>  **Click** Watch Now.  **Register** for a free account to access the webinar.  **Watch** “Teaching Students to Drive Their Brains,” available from ASCD.  **Post** any comments and questions to the Week Six General Discussion. | | 6.1, 6.2, 6.3 | Discussion board: Comments and questions =  **1 hour** |
| **Resource: Neuroscience Reveals that Boredom Hurts, by Judy Willis**  This article seeks to explain why boredom hinders learning and what techniques can be leveraged to overcome boredom and spur achievement.  **Read** “[Neuroscience Reveals that Boredom Hurts](https://drive.google.com/file/d/0B2eJxDQxPEwxZGdNd1ZWMnVGLWM/view?usp=sharing),” available from Phi Delta Kappan.  **Post** any comments and questions to the Week Six General Discussion. | | 6.3 | Discussion board: Comments and questions =  **30 minutes** |
| **Resource: The Neuroscience of Learning**  This video is an introduction to a Lynda.com training course about neuroscience and learning. You are not required to join the course, although you may do so if you like. You’ll be watching the introductory video, which is freely available. Pay attention to how the presenter talks about motivation and how it can drive performance. Compare the information in the video to information that you’ve encountered this week in your other readings.  *Note*. This is a preview video.  **Watch** “[The Neuroscience of Learning](https://www.lynda.com/Higher-Education-tutorials/Neuroscience-Learning/188434-2.html),” available from Lynda.com [6:03].  **Post** any comments and questions to the Week Six General Discussion. | | 6.2, 6.3 | Discussion board: Comments and questions =  **15 minutes** |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Articles: Neuroscience and Learning**  **Read** the following articles on neuroscience and learning:   * [Neuroscience in Schools](https://drive.google.com/file/d/0B2eJxDQxPEwxSFFIdFUzRlJHMjQ/view?usp=sharing), by Ron Schachter * [An Awareness of Neuroscience in Education](https://drive.google.com/file/d/0B2eJxDQxPEwxdEpXdGY2OUFpdHc/view?usp=sharing), by Alex Elwich * [New Foundations of Adolescent Learning](https://drive.google.com/file/d/0B2eJxDQxPEwxQ2Vyc1ZmTkM4Smc/view?usp=sharing), by Laurence Steinberg | | 6.2, 6.3 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Brain Targeted Teaching Model**  Effective instruction must include integrating the arts into teaching methodologies as a powerful way to foster creative, divergent thinking.  **Respond** to the following question in the “Brain Targeted Teaching Model” discussion forum by Thursday:   * Summarize the “Brain-Targeted Teaching Model. Explain its possible use in schools to enhance an arts-integrated curriculum.   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 6.2, 6.3 | Discussion: one post and replies to three other posts = **1 hour** |
| **Discussion: Growth Mindset**  Stanford psychologist Carol Dweck’s work helps educators understand how to promote growth mindsets versus fixed mindsets.  **Respond** to the following question in the “Growth Mindset**”** discussion forum by Thursday:   * How can Carol Dweck’s concept of “growth mindset” be a powerful vision in the teaching and learning of special education students?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday | | 6.1, 6.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Concept Paper: Neuroscience Explained**  **Write** a 1,050- to 1,750-word research paper about a neuroscience topic of your choice from Weeks 4-6 that accomplishes the following:   * Analyzes the current scientific attitude/findings toward the topic * Explains why the neuroscience could be valuable in a teaching and learning context * Describes why you personally find this information useful or relevant to the realm of education   **Include** relevant APA citations with your paper.  *Note*. This topic should be different from the topic explored in your first concept paper!  **Submit** this assignment to your instructor via Blackboard no later than 11:59 p.m. (EST) on Sunday. | | 6.1, 6.2, 6.3 | Research paper =  **1 hour** |
| **Total** |  |  | **3 hours** |

# Faculty Notes

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| Week Seven: Further Implications for Education | |  |  |
| ***Learning Objectives*** | | ***Alignment*** | |
| * 1. Construct action plan that incorporates the ideas associated with educational neuroscience. | | CLO1, CLO2, CLO3 | |
| * 1. Assess the usefulness of neuroscience in the realm of education, specifically special education. | | CLO1, CLO2, CLO3 | |
| ***Resources, Activities, and Preparation***  *Utilize these resources and complete these activities in preparation for your graded assignments.* | | ***Alignment*** | ***AIE*** |
| **Week Seven Reading**  **Read** the following chapters in*Mind, Brain, and Education*(Sousa):   * Chapter 12: The Future of Educational Neuroscience (pp. 249 - 269)   **Read** the following chapters in*The Motivated Brain* (Gregory & Kaufeldt):   * Chapter 6: Leaveraging the SEEKING System to Maximize Student Attention, Engagement, and Perseverance (pp. 125 - 149)   **Post** any comments and questions to the Week Seven General Discussion. | | 7.1, 7.2 | Discussion board: Comments and questions =  **1 hour** |
| **Resource: Neuroscience and Special Education, by Eve Müller**  Eve Müller, PhD, explores the techniques and applications of neuroscience to the practice of special education teaching.  **Read** “[Neuroscience and Special Education](https://drive.google.com/file/d/0B2eJxDQxPEwxY0t6Zjc0Zlp5SGc/view?usp=sharing),” available from inForum.  **Post** any comments and questions to the Week Seven General Discussion. | | 7.2 | Discussion board: Comments and questions =  **30 minutes** |
| ***Supplemental Resources and Activities***  *Explore these optional resources to deepen your understanding.* | | ***Alignment*** | ***AIE*** |
| **Resource: Brain-(not) Based Education: Dangers of Misunderstanding and Misapplication of Neuroscience Education, by Larry A. Alferink & Valeri Farmer-Dougan**  **Read “**[Brain-(not) Based Education: Dangers of Misunderstanding and Misapplication of Neuroscience Education](https://drive.google.com/file/d/0B2eJxDQxPEwxZXhhMTlhRVhLVW8/view?usp=sharing),” by Larry A. Alferink & Valeri Farmer-Dougan. | | 7.1, 7.2 |  |
| ***Graded Assignments***  *Complete these graded assessments by the end of the week unless specified otherwise.* | | ***Alignment*** | ***AIE*** |
| **Discussion: Potential Impact of Neuroscience on Education**  **Respond** to the following question in the “Potential Impact of Neuroscience on Education**”** discussion forum by Thursday:   * What do you feel is the potential impact of neuroscience on education? Justify your response. * What aspects of neuroscience do you feel may have the largest future impact on teaching and learning? * Which aspects of neuroscience do you feel most compelled to follow in the future? Why?   **Post** constructive criticism, clarification, additional questions, or your own relevant thoughts to three of your classmates' posts by Sunday. | | 7.2 | Discussion: one post and replies to three other posts = **1 hour** |
| **Action Plan: School-Wide Educational Neuroscience**  **Review** the Action Plan Planning Template.  **Choose** a school environment that you are familiar with.  **Create** a 600- to 750-word education-based action plan for improving the teaching and learning at the school of your choice.  **Include** the following components in your action plan:   * Description of the neuroscience behind each aspect of your action plan * Actionable ideas based on neuroscience for improving teaching and learning in the school environment you’ve chosen * Assessment system for tracking progress (i.e., how will you know that your interventions are effective?)   *Note*. Your interventions should be detailed and actionable. Make sure to describe the neuroscience research which suggests each intervention.  **Submit** this assignment to your instructor via Blackboard no later than 11:59 p.m. (EST) on Sunday. | | 7.1, 7.2 | Research paper =  **1 hour** |
| **Total** |  |  | **2 hours** |

# Faculty Notes

# Breakdown of Academic Instructional Equivalencies

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|  | **AIE Hours** |
| **Week 1** |  |
| Required | 5.5 |
| Supplemental | 1 |
| **Week 2** |  |
| Required | 7 |
| Supplemental |  |
| **Week 3** |  |
| Required | 6 |
| Supplemental |  |
| **Week 4** |  |
| Required | 5 |
| Supplemental |  |
| **Week5** |  |
| Required | 5 |
| Supplemental |  |
| **Week 6** |  |
| Required | 6.25 |
| Supplemental |  |
| **Week 7** |  |
| Required | 4.5 |
| Supplemental | 1 |
|  |  |
| **Total Required Hours** | 38.25 |
| **Total Supplemental Hours** | 2 |
| **Total Hours** | 40.25 |