



## **Using Brain Research to Improve Learning**

### **Colorado State University – Pueblo: ED 501 – 3 Semester Hours**

Thank you for registering for this course. Included are the following important documents:

1. Course Syllabus
2. Assignment Plan – Assignments to turn in & Grading Rubric
3. Course Hourly Breakdown
4. Participant Evaluation Form

**Course Format:** This is an online course.

**Assignment Deadline:** This course is a rolling course throughout the year, which means it does not have a specific deadline to submit completed assignments. However, you must submit all completed assignments by 6 months after the registration date with Credits for Teachers.

**Registering with CSU Pueblo:** Please register with the university prior to starting your coursework. Students must register for the course through CSU Pueblo prior to the end of the semester in which they are enrolled with Credits for Teachers. To register, visit their [website here](#). If you are planning on using this course towards CSU Pueblo's online Master's Program, you still need to complete this step in the registration process.

**Upon Completion of the Course:** Please complete a short (about 2 minutes) Course Evaluation by clicking the following link: [Course Evaluation Form](#). To submit coursework, please submit all completed assignments in PDF format in one email to [grades@creditsforteachers.com](mailto:grades@creditsforteachers.com). Please allow up to 2 weeks from the date assignments are submitted to receive your final grade and up to 4 weeks for the grade to be added to your transcript.

**Contact Info:** If you need assistance or have any questions, feel free to contact our staff, including our instructor Kristina McKelfresh, by emailing at [info@creditsforteachers.com](mailto:info@creditsforteachers.com).

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## Brain Research - Syllabus

ED501

3 credits

**Course Description:** This course offers many different brain research-based strategies to help educators improve student learning. The course also provides an understanding of the brain and how it works, especially while the brain is learning. The basis of the course is developing an understanding of how the workings of the brain can help educators better their teaching. The strategies offered help improve student memory as well as memory retrieval which therefore helps them learn.

### Course Learning Objectives:

- Students will learn and understand how the brain works while it is learning.
- Students will learn different strategies of how to make better neural connections in the brain, how to transfer information from short-term to long-term memory, and how to retrieve those memories.
- Students will be able to apply brain research to develop better teaching practices in order to improve student learning.
- Students will develop skills to reflect on & improve their own teaching practices.

### Student Learning Outcomes (SLOs):

This course addresses the following student learning outcomes to the degree shown in the table. Degree Addressed is rated according to the following scale:

1=Basic, 2=Developing, 3=Proficient, 4=Advanced

Student Learning Outcome	Degree Addressed
1. Demonstrate growth in content knowledge related to teaching assignment and the application of content knowledge to classroom instruction and assessment.	3
2. Understand scientifically-based practices in teaching and learning, including strategies in literacy education, instructional technology, differentiation of instruction, and apply them to raise student achievement.	2
3. Demonstrate multiple means of assessing and evaluating student learning and use them to change teaching and learning.	2
4. Locate, interpret, synthesize, and apply educational research in best practices in teaching.	2
5. Understand models for professional change, including teacher collaboration, professional learning communities, strategies for mentoring and coaching to facilitate change, and effective professional development.	1
6. Demonstrate understanding of reflective practice that results in improved classroom teaching and learning, including teacher reflection, use of technology in self assessment, collaboration for change, and self-management of change.	2
7. Demonstrate understanding of system and organizational change in education, including models for school change and current research and trends in school change.	1
8. Demonstrate responsibility for student learning at high levels.	3

**Course Text(s) and Materials:**

- Readings:
  - *Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher* by Judy Willis, M.D. (pg. 1-105)
  - *Brain-Based Learning: Teaching the Way Students Really Learn* by Eric Jensen and Liesl McConchie. (pg. 1-193)

\*NOTE: These books will not be provided by Credits for Teachers or CSU Pueblo. Students will need to purchase these books. The price is not included in the purchase price of the course.
- Video:
- Brain Based Learning
  - Brain Based Learning (5:10)
- Implementation:
  - Semester Plan Template
  - Hour Log Template
  - Hour Log Example

\*NOTE: The example is meant to act as a reference for what different entries could look like in the hour log assignment. Although this example relates to the *Growth Mindset* course, it is meant to be used as a model for what to include in the hour log assignment. Students are expected to include their own entries.
- [Course Evaluation Form](#)

**Course Requirements & Assignments:**

1. Read the books *Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher* by Judy Willis, M.D. and *Brain-Based Learning: Teaching the Way Students Really Learn* by Eric Jensen and Liesl McConchie.
2. Watch the following video:
  - Brain Based Learning
3. In at least 1 page, explain how understanding more about the brain and how it works to learn new information can help you be a better teacher? Refer to the readings and video and discuss the parts that were most helpful for you.
4. The beginning of the book *Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher* the other discusses the idea of pruning and “use it or lose it.” In at least 2 pages, explain different examples of how you have seen this in action either in your classroom with your students or in your own experiences with your own learning. Then, discuss ways you have made or will make sure students make thicker connections between neurons so the neurons are not pruned.
5. Research brain-based learning and using brain-based research in the classroom. Then find 3 resources that discuss this and how it can affect student learning. The resources must specifically include strategies on how brain-based research strategies can be integrated into the classroom.

Then, in at least 2 pages, compare and contrast the 3 resources you found and explain which strategies you think will be most effective at improving student learning within your classroom

and improving your practice in general. Please include an MLA bibliography of the 3 resources, including links to the resources if applicable, at the end of the assignment.

6. Create a Semester Plan for how you will incorporate the brain research strategies into your lessons for the upcoming semester. Within each week of the Semester Plan, implement at least 1 strategy from the course. These strategies can be from the readings or a combination of the readings and your additional research. Strategies should also be planned in a manner in which they can build upon one another throughout the semester. Make sure the plan includes...
  - The units of study that will be taught within the semester
  - Content standards and essential question(s) for each unit
  - Summary of how you will incorporate brain research strategies within each unit
  - Strategy(ies) used each week and why you selected them
  - 1 lesson plan per unit

The lesson plan within each unit should outline a more detailed plan of how you will incorporate strategies from the course within a lesson within that particular unit. Each lesson plan should include the following:

- Objectives or learning targets
- Agenda for the day with strategies from the course
- Closure for the lesson

A link to a Semester Plan template can be found above in “Course Materials.”

7. Complete an hour log that logs the hours when you implement strategies from the course. Choose some upcoming lessons to begin implementing the brain research strategies in your classroom with your students. Use a minimum of 5 of the following brain research strategies to guide your planning and teaching. Use examples from the readings to help you as well.
  - Use multiple ways to learn the material through multiple senses
  - Incorporate multiple subjects = make it cross curricular
  - Cultivate an enriched, positive, safe, & inclusive environment
  - Use application activities to move information from short-term to long-term memory
  - Personalize the information/make it relevant for the students
  - Incorporate some element of surprise
  - Incorporate storytelling
  - Incorporate movement
  - Minimize levels of stress for the students while still incorporating some level of challenge
  - Give brain breaks or “syn-naps”
  - Incorporate a teachable moment

Spend a minimum of 25 hours (about 1-2 weeks) implementing the strategies from the course and log the 25 hours. Possible options to use for logging hours include but are not limited to:

- Planning lessons
- Teaching lessons
- Reflections on practice
- Research of course topics
- Planning with colleagues

For each day, briefly explain what you accomplished, the lesson you taught, the strategies from the course utilized, and their effectiveness on students’ learning. Make sure to include dates, the total

hours spent each day or for each entry, and the total hours spent overall. Links to an Hour Log template and example can be found above in “Course Materials.”

\*NOTE: You will expand and elaborate on the strategies used and how it all went in your Final Reflection assignment. The hour log is meant to serve as a brief description of recorded evidence that 25 hours of course content implementation were completed.

Additionally, use this log as an opportunity to reflect on the successes of implementing various strategies and what modifications can be made to improve the success of these strategies in subsequent lessons.

8. Final Reflection: Follow the guidelines below.
  - a. After consistently implementing a minimum of 5 of the brain research strategies in your lessons for 1-2 weeks (25 hours), reflect on the effectiveness of using these strategies on your teaching and student learning.
  - b. Write a minimum two-page paper explaining the impact of using brain research strategies on your teaching and on student learning. Make sure to answer the following questions in your reflection.
    - i. What strategies did you implement, and what did they look like and/or sound like? What were you doing as the teacher? What were students doing?
    - ii. Were the methods and strategies successful and did you notice a difference compared to when you taught that topic in the past?
    - iii. What did you do to support the effectiveness of the methods and strategies used? Did you modify any of the strategies to help meet your needs or the needs of your students? If so, describe the modifications and explain the reasoning behind them.
    - iv. What was challenging or didn't work as well as you would have hoped?
    - v. How would you modify any part of what you implemented to make it more effective in the future?
    - vi. What did you take away from this research to use in the future?

## Brain Research - Suggested Hourly Breakdown:

Course readings, videos & additional materials	30
Reading & Video Reflection Assignment	3
Pruning Reflection Assignment	3
Research Paper Assignment	15
Semester Plan Assignment	25
Practicing strategies/techniques in the classroom	25
Hour Log Assignment	4
Reflecting on lessons and effectiveness of strategies	4
Final Reflection Assignment	6

Total Hours 115

## Upon Completion of the Course:

1. Please submit all assignments in PDF format to [grades@creditsforteachers.com](mailto:grades@creditsforteachers.com).
2. Complete a Course Evaluation (2 minutes) by using the link below -  
[Course Evaluation Form](#)

## Attendance/Participation:

This is a self-paced online course. Students have 6 months after registering with Credits for Teachers to complete and submit all course assignments. Students will participate by showing evidence of implementing course strategies into their lessons and curriculum.

## Grading:

Reading & Video Reflection (Written Response Rubric)	X/10 pts
Pruning Reflection (Written Response Rubric)	X/10 pts
Research Paper Assignment (Research Paper Rubric)	X/15 pts
Semester Plan Assignment (Semester Plan Rubric)	X/20 pts
Hour Log Assignment (Hour Log Rubric)	X/15 pts
Final Reflection on Brain Research (Final Reflection Rubric)	X/30 pts
Final Grade	X/100 pts

## Final Grade Scale:

90-100 - A  
80-89 - B  
70-79 - C  
60-69 - D  
59 & Below - F

## Grading Process:

Our graders will grade all of your assignments once you have submitted everything to [grades@creditsforteachers.com](mailto:grades@creditsforteachers.com). After everything has been graded, you will receive an email containing your final grade and certificate of completion for the course. The certificate outlines the individual grades for each assignment, the final grade for the course, and general comments about the coursework.

You also have the option to redo and resubmit an assignment after your coursework has been graded. If you do not agree with a grade or you would like to redo an assignment to improve a grade, please contact us at [info@creditsforteachers.com](mailto:info@creditsforteachers.com) with the following information: your name, the course name, and specifics about your grade inquiry.

### **Rubrics:**

Written Response Rubric (Used for Reading & Video Reflection & Pruning Reflection):

Grade	Description
A (9-10)	Student answers all questions thoroughly with detail. The responses are well thought out and in depth and show understanding of the brain as it relates to learning. The examples given are detailed to the point that it is very clear what the outcome will look like in the classroom.
B (8)	Student answers all questions. Examples of new strategies are explained. More detail could have been given in one or more of the responses.
C (7)	Some questions are complete while others are not. Student may have left out examples or just failed to answer all parts of the question. Strategies from the course are mentioned but full understanding is missing.
D (6)	Student has attempted to answer all questions but answers are incomplete. Not all parts of the questions are addressed and/or the strategies mentioned do not reflect the brain-based research from the course.
F (0-5)	Answers are incomplete with a one or two sentence answer. There is no elaboration. Strategies are missing or do not reflect the brain-based research from the course.

Research Paper Rubric:

Grade	Description
A (14-15)	Student has written a complete, detailed paper comparing and contrasting 3 or more articles. All of the articles clearly pertain to course content. Student has explained in detail which strategies from the articles they think will be most effective at helping improve student learning and their practice in general.
B (12-13)	Student has written a complete paper comparing and contrasting 3 articles. Two of the articles pertain to course content, while one does not. Student has explained which strategies from the articles they think will be most effective at helping improve student learning and their practice in general.
C (11)	Student has written a paper comparing and contrasting 2 articles. The two articles pertain to course content. Student has briefly explained which strategies from the articles they think will be most effective at helping improve student learning and their practice in general.
D (9-10)	Student has written a paper comparing and contrasting 2 articles. One of the articles pertains to course content, while one does not. Student has partially explained which strategies from the articles they think will be most effective at helping improve student learning and their practice in general, but the explanation is incomplete. Only a few strategies are mentioned and it is unclear how each one will be effective.
F (0-8)	Student has written a paper about 1 article. The article may or may not pertain to course content. Student has only mentioned 1-2 strategies from the article. Student has partially (or not at all) explained how the strategy(ies) will be effective at helping improve student learning and their practice in general, but the explanation is incomplete and unclear.

### Semester Plan Rubric:

Grade	Description
A (18-20)	Student's plan covers an entire semester, includes multiple units, and includes all of the required components. Student also includes all of the required components for each lesson plan within each unit. Student demonstrates the implementation of 1 or more learned strategies per week, and there is clear evidence that one or more strategies from the course are incorporated within each lesson plan.
B (16-17)	Student's plan covers an entire semester, includes multiple units, and includes all of the required components. Student also includes all of the required components for the majority of the lesson plans within each unit, but 1 lesson plan is incomplete. Student demonstrates the implementation of 1 learned strategy per week, and there is evidence that one strategy from the course is incorporated within each lesson plan.
C (14-15)	Student's plan covers the majority of a semester, but a few weeks are missing. The plan includes multiple units and includes the majority of the required components. However, at least 1 unit is incomplete. Student also includes the required components for the majority of the lesson plans within each unit, but 2 lesson plans are incomplete. Student demonstrates the implementation of 1 learned strategy per week for the majority of the weeks, but 1-3 weeks do not have a strategy mentioned. There is evidence that one strategy from the course is incorporated within all but one lesson plan.
D (12-13)	Student's plan covers part of a semester, but multiple weeks are missing. The plan includes 1-2 units and includes some of the required components. However, all of the units are incomplete. Student includes some of the required components for the lesson plans within each unit, but all of the lesson plans are incomplete, or 1 or more units do not have a lesson plan. Student demonstrates the implementation of 1 learned strategy per week for the majority of the weeks, but 4-7 weeks do not have a strategy mentioned. Only 1 lesson plan has one strategy from the course incorporated.
F (0-11)	Student's plan covers half or less of a semester. The plan includes 1 unit and includes little of the required components. Student's lesson plan is incomplete or missing all together. Student demonstrates the implementation of 1 learned strategy per week for half or less of the weeks.

### Hour Log Rubric & Requirements (Minimum 25 hours):

Grade	Description
A (14-15)	Student keeps a detailed log of daily activities and there is clear evidence of how the 25 hour requirement has been fulfilled. Student demonstrates the implementation of strategies from the course and provides 4 or more in-class examples. Student provides regular reflection on the success of these strategies and shows an understanding of how they can be modified for the future.
B (12-13)	Student keeps a log of daily activities and there is evidence of how the 25 hour requirement has been fulfilled. Student demonstrates the implementation of strategies from the course and provides 3 in-class examples. There is some reflection on the effectiveness of these strategies.
C (11)	Student keeps a log of daily activities and there is evidence of how the 25 hour requirement has been fulfilled. Student demonstrates some implementation of strategies that were learned & provides 2 in-class examples. There is some reflection on the effectiveness of these strategies.
D (9-10)	Student keeps a basic log of daily activities and there is some evidence of how the 25 hour requirement has been fulfilled, but the log does not add up to 25 hours. Student



	demonstrates some implementation of strategies from the course & provides 1 in-class example. There is little reflection on the effectiveness of these strategies.
F (0-8)	Student keeps a basic log of daily activities and there is little evidence of how the 25 hour requirement has been fulfilled. The log does not add up to 25 hours. Student demonstrates little implementation of strategies from the course and there is no reflection on the effectiveness of these strategies.

#### Final Reflection Rubric:

Grade	Description
A (27-30)	Student has incorporated 5 or more of the strategies listed in the assignment (#7). There is a detailed explanation of how each strategy was implemented within the lesson(s), and the explanation clearly shows an understanding of each strategy. If anything was modified, an explanation of how and why strategies were modified is included. Lastly, student has answered all of the reflection questions.
B (24-26)	Student has incorporated 4 of the strategies listed in the assignment (#7). There is an explanation of how the strategies were implemented within the lesson(s), and the explanation shows an understanding of the strategies mentioned. If anything was modified, an explanation of how and why strategies were modified is included. Lastly, student has answered all of the reflection questions.
C (21-23)	Student has incorporated 3 of the strategies listed in the assignment (#7). There is an explanation of how the strategies were implemented within the lesson(s), and the explanation shows an understanding of the strategies mentioned. If anything was modified, an explanation of how and why strategies were modified is included. Lastly, student has answered the majority of the reflection questions, but some questions are not addressed.  OR Student has completed the requirements listed to receive a "B". However, the explanation of the strategies is incomplete, it is unclear how the strategies were implemented, and there is little understanding of the strategies mentioned. Lastly, student has answered the majority of the reflection questions, but some questions are not addressed.
D (18-20)	Student has incorporated 2 of the strategies listed in the assignment (#7). There is an explanation of how the strategies were implemented within the lesson(s), but it is incomplete and not all of the strategies from the lessons are explained. The explanation does not show an understanding of the strategies mentioned. Lastly, student has answered the majority of the reflection questions, but some questions are not addressed.
F (0-15)	Student has incorporated 1 of the strategies listed in the assignment (#7). Very little is explained about how the strategy was implemented within the lesson(s), and the explanation does not show an understanding of the strategy mentioned. Student has answered some of the reflection questions but responses are very incomplete, or none of the questions have been answered.

#### Late Work:

Coursework is late if it is not submitted via [grades@creditsforteachers.com](mailto:grades@creditsforteachers.com) by the 6 month deadline (6 months after the registration date with Credits for Teachers). If coursework is submitted late or if a student needs more time to complete their coursework, they will be required to renew their registration at [www.creditsforteachers.com](http://www.creditsforteachers.com) and will be subject to a registration renewal fee.

Credits for Teachers understands that at times there are extraordinary circumstances that occur and

should be taken into consideration. These circumstances must be shared with Credits for Teachers before the 6 month deadline in order for a one-time extension to be given.

\*NOTE: Credits for Teachers grants one courtesy extension per person, not per order.

### **Incomplete Grades:**

Incomplete Grades will be handled according to the University Catalog. If an incomplete grade is issued, the student, instructor, and Associate Dean will develop an agreement for the terms of the incomplete and sign it.

### **Student Conduct:**

Students are required to follow the policies set within the Student Code of Conduct at CSU Pueblo. This Code can be found on the Student Affairs website at

<https://www.csupueblo.edu/student-affairs/student-conduct/index.html>. Students with questions regarding any guidelines within the Code should contact the Director of Student Conduct and Case Management at 719-549-2092.

### **Accommodations:**

If you have a documented disability that may impact your work in this class and for which you may require accommodations, please see the Disability Resource & Support Center (DRSC) as soon as possible to arrange services. The DRSC is located in LARC 169, and can be reached by phone (719-549-2648) and email ([dro@csupueblo.edu](mailto:dro@csupueblo.edu)).

### **Academic Dishonesty:**

Academic dishonesty is any form of cheating that results in students giving or receiving unauthorized assistance in an academic exercise or receiving credit for work which is not their own. In cases of academic dishonesty, the instructor will follow protocol as identified by their department. Academic dishonesty is grounds for disciplinary action by both the instructor and the Director of Student Conduct and Community Standards. Any student found to have engaged in academic dishonesty may receive a failing grade for the work in question, a failing grade for the course, or any other lesser penalty which the instructor finds appropriate. To dispute an accusation of academic dishonesty, the student should first consult with the instructor. If the dispute remains unresolved, the student may then state their case to the department chair (or the dean if the department chair is the instructor of the course). A student may appeal a grade through the Academic Appeals Board, if eligible.

Academic dishonesty is a behavioral issue as well as an issue of academic performance. As such, it is considered an act of misconduct and is also subject to the University conduct process as defined in the CSU Pueblo Student Code of Conduct. Whether or not disciplinary action has been implemented by the faculty, a report of the infraction should be submitted to the Office of Student Conduct & Community Standards who may initiate additional disciplinary action. The decision by the Office of Student Conduct & Community Standards may be appealed through the process outlined in the Student Code of Conduct.

### **Mandatory Reporting:**

Colorado State University Pueblo is committed to maintaining respectful, safe, and nonthreatening educational, working, and living environments. As part of this commitment, and in order to comply with federal law, the University has adopted a Policy on Discrimination, Protected Class Harassment, Sexual Misconduct, Intimate Partner Violence, Stalking, & Retaliation. You can find information regarding this policy, how to report violations of this policy, and resources available to you, on the Office of Institutional Equity's website ([www.csupueblo.edu/institutional equity](http://www.csupueblo.edu/institutional-equity)).

Please familiarize yourself with the reporting requirements of this policy. Because faculty and staff at CSU Pueblo are "Responsible Employees," we have to report to the Director of the Office of Institutional

Equity if you tell us that you were subjected to, or engaged in, any of the following acts: *discrimination, protected class harassment, sexual misconduct, intimate partner violence, stalking, and retaliation.*

**References:**

Hutton, Graham, director. *Brain Based Learning*. YouTube, YouTube, 24 Feb. 2018, [www.youtube.com/watch?v=-T9f50\\_uvlg](http://www.youtube.com/watch?v=-T9f50_uvlg).

Jensen, Eric, and Liesl McConchie. *Brain-Based Learning: Teaching the Way Students Really Learn*. Corwin, a SAGE Company, 2020.

Willis, Judy. *Research-Based Strategies to Ignite Student Learning: Insights from a Neurologist and Classroom Teacher*. Association for Supervision and Curriculum Development, 2006.

Thank You!

