**Principles of Brain-Based Learning:**
**Teaching 21st Century Minds**
**Site-based Participant Syllabus**

## Course Description

This course is designed to enhance a participant's knowledge of brain research. The following themes will be explored: brain development, information processing, memory and retention, transferring learning, and critical thinking. Participants in this course will explore ways to design brain-friendly and effective lesson plans using the latest scientific findings and discoveries. This course prepares teachers by providing them with the essential elements needed to translate the biology of brain-based learning from theory into classroom practice.

## Course Prerequisites

Educators enrolled in the course are required to hold a baccalaureate degree.
No prerequisites for this course are required.

## System Requirements

- Computer with word processing software
- Internet access connection
- Online video viewing capabilities/Adobe flash player
- Software capable of reading PDF files

## Text Books/Supplemental Reading

Textbook will be provided on the first day of class.

## Global Goals of the Course

To deepen and/or apply the content and skills of the teacher's existing professional knowledge base by meeting the following global goals of this course:

1. To understand the educational implications of recent discoveries from brain research on teaching methodologies and the learning process (NBPTS 1,2,3,5) (ISTE 1,2) (InTASC 1,4)
2. To examine and evaluate instructional strategies which have evolved from the application of brain research (NBPTS 2, 3) (ISTE 3) (InTASC 4,5)
3. To apply this brain-based research to the teacher's grade-specific professional teaching environment, students, and/or discipline (NBPTS 4, 5) (ISTE 1) (InTASC 1,2,3,4,5,8)

4. To understand how the brain develops at the various ages and stages and the implications this process has on cognitive, social, emotional, and academic factors (NBPTS 2, 3) (ISTE 1, 2, 3, 4, 5) (InTASC 1,2,3,4,5,)
5. To learn how effective brain-based strategies can increase memory, laterization of hemispheres and retention of information (NBPTS 1, 2, 3,) (ISTE 1, 2) (InTASC 1,2, 7, 8)
6. To analyze the differences between short-term memory, long-term memory, working memory and sensory memory (NBPTS 2, 3) (ISTE 1) (InTASC 1,2,3, 7,8)

## Instructional Objectives

By the conclusion of the course, each participant should be able to do the following:

1. Examine the basic biological and physiological make-up of the brain.
    - 1.1 Review the parts of the brain and their impact on learning.
    - 1.2 Understand the environmental influences (social, physical, emotional, and experiential) that shape learning.
    - 1.3 Understand how the brain processes information and is able to utilize that knowledge in lesson planning.
2. Explore memory, retention, and learning.
    - 2.1 Understand the differences between short-term, long-term, declarative, procedural, emotional, and sensory memories.
    - 2.2 Review teaching techniques that improve memory and retention of information.
    - 2.3 Examine the critical stages of brain develop for school-aged children and the implications on retention of information.
3. Understand the transfer of information and teaching methods that support it.
    - 3.1 Investigate strategies that enhance cross lateralization.
    - 3.2 Learn factors that affect transfer and discover how teachers can use past learning to enhance future learning.
    - 3.3 Consider ways to construct meaning, deepen understanding, and retain new information.
4. Investigate dimensions of human thinking.
    - 4.1 Discover how the fine arts impact creative thinking.
    - 4.2 Compare critical thinking and the relationship to intelligence.
    - 4.3 Analyze the impact poverty has on brain development and intelligence.
    - 4.4 Understand the influence of social and environmental factors on learning.
5. Devise classroom strategies built for the learning brain.
    - 5.1 Apply brain-based research and strategies into lesson plans.
    - 5.2 Know how and why current teaching-learning practices fail or succeed, based on brain research.

5.3 Explore the implications scientific discoveries have on brain-based teaching.

## Teaching Methodology and Delivery Model

Teaching methodologies of this course are designed to support intensive, graduate level course work in an interactive setting.

Instructional plans support the content of this course, which focuses on the improvement of professional teaching expertise in any or all of the following categories: assessment, collaboration, communication, diverse learners, educational reform, instructional strategies, planning instruction, productivity, reflection on practice, student learning, subject matter, and/or technology.

- Methodologies include instructor presentations, specific skill practice, discussions, audio-visual presentations, self-evaluation, project development, course readings, research/inquiry exercises, and the synthesis of new knowledge and skills with previously acquired skills/expertise in relation to transition knowledge and content.
- The course is taught with instructor-participant and participant-participant feedback. Course content, activities, and assignments are organized into segments totaling 45 seat hours. Final projects are due within the two-week period immediately following class meetings.
- Research-based content, presentations, and assignments are supported by textbooks and additional readings/handouts designed specifically for education professionals, educator resources in print and on the Internet, notes from instructor presentations, class activity work pages, and references.
- Daily activities include a variety of research-based instructional approaches appropriate for adult learners. Class participants actively construct their own learning and make it personally relevant by acquiring and applying course knowledge/skills during hands-on practice and problem-solving activities, personal reflection, in-class presentations, whole-class discussions and activities, assigned readings, research/inquiry, projects, and collaborative work in various group formats. All are designed to make it possible for teachers and other transition-related personnel across the entire spectrum to learn the same basic content and skills with an emphasis on application to their own specific content area or grade level.

## Learning Assessment

Formative assessment of learning objectives for this course is conducted informally throughout the week via discussion, critiques, peer- and self-evaluations, journal entries, verbal and written instructor feedback, small-group sharing, and activities requiring the participants to make sense of new knowledge and/or skills within their realm of teaching. Additionally, three formative assessments are embedded within the course. Summative assessment for the course occurs in the form of a final

project which requires each participant to synthesize class content and apply it within the teacher's specific teaching environment.

## Compliance with National Board of Professional Teaching Standards

The National Board of Professional Teaching Standards represents the highest level of professional achievement in the continuum of teacher professional development. There are five core principles (standards) which cover five aspects of professional educational practice: (1) commitment to students and their learning, (2) knowledge of subject matter and instructional strategies, (3) management and monitoring of student learning, (4) systematic reflection about the teaching profession to learn and grow from experience, and (5) collaborative participation in the educational learning community.

## Compliance with Interstate Teacher Assessment and Support Consortium (InTASC) Standards

The Interstate Teacher Assessment and Support Consortium's work is guided by one basic premise: An effective teacher must be able to integrate content knowledge with the specific strengths and needs of students to assure that all students learn and perform at high levels. All teachers should meet the following standards: (1) learner development, (2) learning differences, (3) learning environments, (4) content knowledge, (5) application of content, (6) assessment, (7) planning for instruction, (8) instructional strategies, (9) professional learning and ethical practices, and (10) leadership and collaboration.

## Topics Agenda

### Topic One: Course Introduction

Review of syllabus; expectations; course overview; review of NBPTS and ISTE standards; building our community; discussion of all projects (listed in the section below)

### Basic Brain Biology and Its Impact on Learning

This topic will explore the structures of the brain and their functions. It will also describe the rationale for educations to learn about brain-based learning and the implications the research has on teaching. The core principles directing the brain-based education approach will be revealed.

### How the Brain Processes Information

The Information Processing Model is one of the dominant theories in the field of thinking and memory. This model offers a meaningful way for teachers to analyze how information gathered from the environment is ultimately processed into long-term storage.

**Topic Two: How the Brain Processes Information (cont'd)**
The Information Processing Model is one of the dominant theories in the field of thinking and memory. This model offers a meaningful way for teachers to analyze how information gathered from the environment is ultimately processed into long-term storage.

**The Effects of Memory, Sleep, Nutrition on Learning**
This topic will focus on different types of memories, the stages of memory acquisition, and the importance of sleep and nutrition. Memories help students remember information and teachers are memory makers for their students. Strategies to increase retention of information in students' memory will be shared.

**Topic Three: Power of Transfer**
This topic is important since teachers play a vital role in assisting students with transferring knowledge into new learning. The process of transferring information from one situation and then using that learning in a different situation will be discussed. Transfer is critical for new learning and encompasses problem solving, and creative and critical thinking.

**Brain Organization, Learning, & Reading Development**
This topic will look at specific areas of the brain and the tasks they are responsible for in the learning process. Participants will learn how brain preferences impact issues of gender, language acquisition, developing a second language, and literacy. The role of both brain hemispheres will be investigated.

**Topic Four: Brain, Fine Arts, and Exercise**
How music, visual arts, and movement improve learning will be revealed in this topic. The exposure to art and music will be examined in relation to brain development. The impact of exercise and sensory input will also be studied.

**Thinking Skills and Learning**
Different types of thinking will be explored including critical thinking, creative thinking, and metacognition. Bloom's taxonomy will be reviewed and ideas for incorporating Bloom's methods will be shared.

**Topic Five: Different Minds, Different Learners**
This topic will examine the learning needs of students with various abilities and from different backgrounds. The impact of poverty on brain development will be investigated.

### Synthesis and Reflection

Incorporating essential elements needed to translate the biology of brain-based learning from theory into classroom practice; continued peer support and feedback; reflection and progress; incorporating feedback for final project and development

### Course Closure

Course wrap-up, final project, continued synthesis of agenda items 1 - 5 culminating in final project including reflection, application, and future recommendations

## Final Projects

Assignments/ assessments should reflect that each participant is accountable for a high degree of learning; thus, an appropriate combination of group and individual assignments/assessments that can accurately determine an individual's achievement level is required.

In keeping with best instructional and assessment practices, this course requires participants to demonstrate synthesis and application of course knowledge in an applied final project linked to the instructional objectives of this course. Assessment of the project should not be limited to the quantity of work submitted but should carefully consider the quality and intellectual value of the work.

Final projects are due within two weeks of the end of class. Projects submitted during the third week "grace period" will have their grade reduced one full letter grade. No papers will be accepted past the grace period, and participants will, consequently, forfeit credit for the course. Papers are expected to be properly formatted and submitted to the instructor either in person or via mail or an email attachment.

Participants taking professional development unit (not-for-credit) courses must attend all scheduled class sessions and complete all formative assignments. However, they will be exempt from completing the final summative project unless otherwise noted. Proof of seat hours will be presented to the participants after completing course reflection via the student portal and all hours are met.

## Grading

Throughout the course, participants will engage in both formal and informal formative and summative assessments. Points are assigned based on a four-point criterion rubric specifically delineated for each assessment that can be further defined as follows:

**Distinguished:** The assessment is highly imaginative; demonstrates critical thought; is unique; shows substantial application to one's own teaching or professional position; *goes above and beyond requirements;* is creative; demonstrates both

breadth and depth of knowledge of transition-related subject matter; shows individual's personality; is professional in presentation and appearance; and demonstrates considerable effort. The assessment is exceptionally completed and demonstrates clear understanding of the tasks, gives explanations, and shows how the assessment applies to a teaching/learning situation. The assessment meets the specific criteria delineated in "Distinguished" on the course rubric.

**Proficient:** The assessment is well-organized and complete; is effectively and clearly presented; demonstrates clear understandings; applies what has been learned to the author's own classroom situation; clearly shows connections; is detailed; and is thoughtful and supported with ideas. A thoroughly completed assessment demonstrates that the participant shows awareness of the tasks, gives explanations, and shows how the assessment applies to a teaching/learning situation. The assessment meets the specific criteria delineated in "Proficient" on the course rubric.

**Basic:** This is the lowest passing grade. The assessment meets minimum requirements; includes general information but lacks descriptive detail; shows limited application to teaching/learning; and lacks originality. This denotes work that does not meet **all** aspects of standards for academic performance in a graduate-level course. The assessment meets the specific criteria delineated in "Basic" on the course rubric.

**Unsatisfactory:** The assessment is missing evidence or information; is sloppy and poorly organized; demonstrates only surface understandings; shows no evidence of application to the author's own teaching situation; is poorly written; and does not meet minimum standards for academic performance in a graduate-level course. The assessment meets the specific criteria delineated in "Unsatisfactory" on the course rubric.

The assessments for this course are weighted as follows:

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| Participation and Reflection | 30% |
| Formative Assessments | 30% |
| Summative Assessments | 40% |

Letter grades are based on 100 points possible and assigned based on the university grading scale.

## Academic Honesty and Integrity

All participants are expected to maintain academic honesty and integrity by doing their own work to the best of their ability. Academic dishonesty (cheating, fabrication, plagiarism, etc.) will result in the participant receiving a zero for that assignment or paper.

## Americans with Disabilities Act Compliance

In compliance with Section 504 of the Rehabilitation Act and The Americans with Disabilities Act, participants who have any condition, either permanent or temporary, which might affect their ability to perform in this class are encouraged to inform the instructor at the beginning of the first session. Reasonable academic accommodations, aids, and adjustments may be made as needed to provide for equitable participation.

## Attendance

Participants are required to attend all classes as well as participate in class discussions, small group activities, and projects. Absence from any part of the class will require that you withdraw from the class. You will need to contact The Connecting Link at (888) 550-5465 in the event this occurs.

## Emergency Statement

In the event of an emergency declared by the college or by The Connecting Link, we reserve the right to alter course plans and the attendance policy. In the event of an emergency, TCL will contact the instructor/participants with alternative educational plans for the course.

## Late Work and Make-Up Policy

Participants are expected to keep pace with in-class assignments and evening at-home assignments. If a situation arises in which an assignment cannot be completed, the participant is expected to make arrangements with the instructor for the timely submission of such work. All work is due not later than two weeks after the class ends. Failure to complete all work in this time frame will result in an **incomplete** or a grade of **F** for the work, depending on the reason for the delay.

## University Compliance

Course content and instruction are bound by policies associated with the university granting academic credit for the course. Such polices include, but are not limited to: academic integrity and honor codes, institutional objectives and grade grievance procedures. These policies are located within the official academic catalogs which can be accessed through the university's official website.
For Valparaiso University Graduate School Student Learning Objectives please visit: www.valpo.edu/gradschool