UDL101M: Universal Design for Learning: Addressing Learner Variability in Mathematics

COURSE DESCRIPTION:
In this introductory course, participants learn the research basis for and application of UDL to math lesson design. Participants also explore helpful technology tools that support math instruction that address the needs of all learners.

This Universal Design for Learning (UDL) course is designed to equip participants with the ability to evaluate, create, and recreate math lesson plans that ensure the engagement and participation of varied learners within a high standards-based mathematics curriculum. Course sessions have been created within the context of current Massachusetts Curriculum Frameworks and local curriculum requirements to ensure alignment with existing academic standards and benchmarks.

TEXTS:
Also, refer to the readings within each of the sessions.

CURRICULUM STANDARDS & FRAMEWORKS:
Massachusetts 7.08: Professional Standards for Educators
(2) (a) 2. Draws on results of formal and informal assessments as well as knowledge of human development to identify teaching strategies and learning activities appropriate to the specific discipline, age, and range of cognitive levels being taught.
(2) (a) 5. Plans lessons with clear objectives and relevant measurable outcomes.
(2) (a) 7. Incorporates appropriate technology and media in lesson planning.
(2) (a) 8. Uses information in Individualized Education Programs (IEPs) to plan strategies for integrating learners with disabilities into general education classrooms.
(2) (d) 2. Works to promote achievement by all learners without exception.
(2) (d) 3. Assesses the significance of learner differences in home experiences, background knowledge, learning skills, learning pace, and proficiency in the English language for learning the curriculum at hand and uses professional judgment to determine if instructional adjustments are necessary.
(2) (e) 3. Maintains interest in current theory, research, and developments in the academic discipline and exercises judgment in accepting implications or findings as valid for application in classroom practice.

National Board Certification Standards for Professional Educators
- 5 Core Propositions
- Exceptional Needs Standards

National Educational Technology Standards

COURSE REQUIREMENTS:
The course is equivalent to a 3 credit, 45 contact hour, graduate level course.

Every weekly session includes either synchronous or asynchronous sessions.

- Synchronous (web conference) sessions require you to attend and participate in 3 synchronous (web conference) sessions (at the beginning, middle and end of the semester). NOTE: If you cannot attend the session, you are required to watch the recording (posted to Blackboard within 48 hours) and summarize it for
your instructor. You can choose the way you want to do this. For example: write a 1-page essay, a podcast, a PowerPoint, etc. This needs to be submitted within 7 days of the session.

- **Asynchronous sessions** can be completed anytime over the course of the week and include:
  - **required readings and/or media.** Use the guiding questions to guide your thinking and learning as you are reading, watching or listening. **You are not required to submit answers to these questions.**
  - **required activities** to complete. Use the “Pause and reflect” prompts you to think about your experience with the activity. **You are not required to submit answers to these questions.**
  - **one of the following deliverable assignments** (see course map for dates):

- **Synthesis activities (online discussions)** require you to synthesize the readings, activities and to make connections with your own practice in a discussion format with the other participants in the course. A rubric for participation is included in the appendix.

- **Lesson Analysis and Evaluation Activity:** require you to analyze a lesson plan for barriers and evaluate it with one portion of the UDL framework to identify elements of UDL. These are opportunities for you to demonstrate your ability to use the Framework as an evaluative tool.

- **The final assignment** requires you to demonstrate emerging abilities to apply what you have learned about research basis of UDL and the UDL framework to evaluate and make suggestions

**Technology Requirements:**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Microsoft Windows</th>
<th>Apple Macintosh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versions Supported:</td>
<td>Windows 7</td>
<td>OS X 10.6 (a.k.a. Snow Leopard)</td>
</tr>
<tr>
<td></td>
<td>Windows Vista</td>
<td>OS X 10.5 (Intel) (a.k.a. Leopard)</td>
</tr>
<tr>
<td></td>
<td>Windows XP, Service Pack 3</td>
<td></td>
</tr>
<tr>
<td>Browsers Supported:</td>
<td>Internet Explorer 6.x, 7.x, and 8.x</td>
<td>Safari 2.0 and higher</td>
</tr>
<tr>
<td></td>
<td>Firefox 1.5 and above (recommended Java)</td>
<td>Firefox 1.5 and above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Java Runtime Environment (JRE) 5.x or higher</td>
</tr>
<tr>
<td>Processor Speed:</td>
<td>1 Ghz or higher</td>
<td>1 Ghz or higher</td>
</tr>
<tr>
<td>Memory (Minimum):</td>
<td>128 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td></td>
<td>256 MB or higher recommended</td>
<td>512 MB or higher recommended</td>
</tr>
<tr>
<td></td>
<td>1 GB for Windows Vista or 7</td>
<td></td>
</tr>
<tr>
<td>Bandwidth Required:</td>
<td>56 Kbps</td>
<td>56 Kbps</td>
</tr>
<tr>
<td></td>
<td>256 Kbps recommended (minimum DSL)</td>
<td>256 Kbps recommended (minimum DSL)</td>
</tr>
<tr>
<td>Display (Minimum):</td>
<td>1024x768 or higher, with 16-bit color</td>
<td>1024x768 or higher, with 16-bit color</td>
</tr>
<tr>
<td>Other Hardware:</td>
<td>Full duplex sound card</td>
<td>Full duplex sound card</td>
</tr>
<tr>
<td></td>
<td>Speakers (USB headset recommended)</td>
<td>Speakers (USB headset recommended)</td>
</tr>
<tr>
<td></td>
<td>Microphone OPTIONAL (USB headset recommended)</td>
<td>Microphone OPTIONAL (USB headset recommended)</td>
</tr>
<tr>
<td>Required for Viewing</td>
<td>Adobe Flash Player 9.x</td>
<td>Adobe Flash Player 9.x</td>
</tr>
<tr>
<td>Recordings:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To test your system regarding the requirements below, go to [http://www.ilinc.com/services/support](http://www.ilinc.com/services/support) and click on the “Join” button to join the session test. You should also see all green checkmarks in the System QuickCheck box on the same page. **Be sure to test your speakers and/or headset while you are in the session test!** To test the Java version on your computer, go to [http://www.java.com/en/download/testjava.jsp](http://www.java.com/en/download/testjava.jsp).

**EVALUATION OR GRADING POLICY:**
Assessment will be based on participation in course synthesis activities such as online discussions, web conference
sessions, lesson analysis worksheets and completion of the final assignment. See rubrics in the appendix for details on how the work will be evaluated. Instructors will provide ongoing assessment throughout the course via timely and relevant feedback to discussion forum postings including comments and post ratings. Authenticity of your work will be verified.

**Late Submissions:**
Work that is submitted after the due date will not receive full credit. If there are extenuating circumstances that warrant late submission of work, you are expected to contact your instructor to develop a plan for submission or makeup. Acceptance of late work is at the discretion of the instructor.

**Quality Expectations:**
This course is equivalent to a 3 credit, graduate level courses. The work presented for grades must be rooted in adequate theory and will require a high level of critical thinking, analysis and synthesis of material.

**Point Value breakdown:**

<table>
<thead>
<tr>
<th>Task</th>
<th>Maximum Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven Online Synthesis Activities (Discussions)</td>
<td>6 points each (42 total)</td>
</tr>
<tr>
<td>Participate in Three Web Conference Sessions</td>
<td>3 points each (9 total)</td>
</tr>
<tr>
<td>Three Lesson Analysis and Evaluation Assignments</td>
<td>6 points each (18 total)</td>
</tr>
<tr>
<td>Final Assignment</td>
<td>31 points</td>
</tr>
</tbody>
</table>

**Grade Equivalents:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>95-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-94</td>
</tr>
<tr>
<td>B+</td>
<td>86-89</td>
</tr>
<tr>
<td>B</td>
<td>83-85</td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>74-76</td>
</tr>
<tr>
<td>C-</td>
<td>71-73</td>
</tr>
<tr>
<td>F</td>
<td>0-70</td>
</tr>
<tr>
<td>W</td>
<td>Withdrawn</td>
</tr>
<tr>
<td>IN</td>
<td>Incomplete</td>
</tr>
<tr>
<td>IP</td>
<td>In-Progress</td>
</tr>
</tbody>
</table>

**Academic Integrity:**
Our Academic Integrity policy is as follows: "Materials submitted in this course must represent your own work except where the work of others is properly attributed (cited). The authenticity of your work will be verified. If an instructor feels that there is evidence that work submitted is not your own, infringes on intellectual property rights or does not comply with US copyright law, he or she is required to bring this matter to the attention of the Department under whose auspices this course is offered. They will investigate the matter and take any proper actions that might be required. For students taking the course for credit, the matter will also be turned over to institution for investigation. Consequences may include failure of assignment, course failure and jeopardizes the status of your teaching license. If you have questions about this policy, it is your responsibility to see the instructor prior to the due date of the first assignment.”
Participants with Disabilities:
You should contact the instructor if you need assistance in developing appropriate accommodations.
<table>
<thead>
<tr>
<th>Session Type/Date</th>
<th>TOPIC</th>
<th>Related Course Goal(s)</th>
<th>What is due?</th>
</tr>
</thead>
</table>
| 1 – Web conference session (real time)| INTRO TO UDL & VARIABILITY IN THE LEARNING CONTEXT | • Participants will examine their current beliefs about the nature of ability.  
• Participants will understand that ability is determined by the interaction of individual variability and the learning context.                  | Participate in a session or submit a summary  
Post a profile to Blackboard                                                                           |
| 2 – Asynchronous session (complete online) |                                           | • Participants will examine their current beliefs about the nature of ability.  
• Participants will understand that ability is determined by the interaction of individual variability and the learning context.                  | Synthesize what you have learned in an online discussion                                               |
| 3 – Asynchronous session (complete online) |                                           | • Participants will understand that neural networks vary across individuals.  
• Participants will understand that the UDL guidelines are a series of levers for addressing learner variability.                   | Synthesize what you have learned in an online discussion                                               |
| 4 – Asynchronous session (complete online) |                                           | • Participants will understand the way that neural networks vary across individuals.  
• Participants will understand that the UDL guidelines are a series of levers that can help educators address learner variability.    | Synthesize what you have learned in an online discussion                                               |
| 5 – Asynchronous session (complete online) | RECOGNITION (the ‘what’ of learning)  
MULTIPLE MEANS OF REPRESENTATION                  | • Participants will be able to explain how the recognition networks of the brain are involved in how we gather information, integrate it into concepts, make connections between them, etc.  
• Participants will be able to describe the way that recognition networks vary across individuals and the challenges that this presents for educators. | Synthesize what you have learned in an online discussion                                               |
| 6 – Asynchronous session (complete online) |                                           | • Participants will be able to explain how the UDL principle—Multiple Means of Representation—helps educators address the variability in learners’ recognition networks.  
• Participants will demonstrate understanding of how the principle Multiple Means of Representation can be used as a lens to evaluate curricula for barriers and elements of UDL. | Analyze a lesson and evaluate for elements of UDL                                                   |
| 7– Web conference session (real time)  | REVIEW & REFLECTION                          | • Participants will understand that the UDL guidelines are levers for addressing learner variability.  
• Participants will understand the way that the UDL framework supports the development of expert learners.                           | Participate in a session or submit a summary                                                         |
<table>
<thead>
<tr>
<th>Session</th>
<th>Asynchronous session</th>
<th>UDL Dimension</th>
<th>Strategies and Activities</th>
</tr>
</thead>
</table>
| 8       | Asynchronous session (complete online) | Strategic Networks (the ‘how’ of learning) | **MULTIPLE MEANS OF ACTION AND EXPRESSION** | • Participants will be able to explain how the strategic networks of the brain are involved in how we act on information, develop strategies, set goals and express what we know.  
• Participants will be able to describe the way that strategic networks vary across individuals and the challenges that this presents for educators.  

| 9       | Asynchronous session (complete online) | Affect (the ‘why’ of learning) | **MULTIPLE MEANS OF ENGAGEMENT** | • Participants will be able to explain how the UDL principle: Multiple Means of Action and Expression helps educators address the variability in learners’ strategic networks.  
• Participants will demonstrate understanding of how the principle: Multiple Means of Action and Expression can be used as a lens to evaluate curricula for barriers and elements of UDL.  

| 10      | Asynchronous session (complete online) | UDL Lesson Planning Process | **PUTTING IT ALL TOGETHER** | • Participants will be able to identify the goals, methods, materials, and assessments in a lesson plan.  

| 11      | Asynchronous session (complete online) | UDL Lesson Planning Process | **PUTTING IT ALL TOGETHER** | • Participants will be able to identify the goals, methods, materials, and assessments in a lesson plan.  

| 12      | Asynchronous session (complete online) | UDL Lesson Planning Process | **PUTTING IT ALL TOGETHER** | • Participants will be able to identify the goals, methods, materials, and assessments in a lesson plan.  

| 13      | Asynchronous session (complete online) | UDL Lesson Planning Process | **PUTTING IT ALL TOGETHER** | • Participants will be able to identify the goals, methods, materials, and assessments in a lesson plan.  

| 14      | Web conference and final assignment | Review, Reflect & Take Aways | **REVIEW, REFLECT & TAKE AWAYS** | • Participants will understand that the UDL guidelines are levers for addressing learner variability and supporting the development of expert learners.  

| 14      | Web conference and final assignment | Review, Reflect & Take Aways | **REVIEW, REFLECT & TAKE AWAYS** | • Participants will understand that the UDL guidelines are levers for addressing learner variability and supporting the development of expert learners.  

Synthesize what you have learned in an online discussion.
RUBRICS:
This course is equivalent to a 3 credit, graduate level course. The work presented for grades requires a high level of critical thinking, analysis, and synthesis of material and must be rooted in adequate theory.

Late Submissions:
Work that is submitted after the due date will not receive full credit. If there are extenuating circumstances that warrant late submission of work, you are expected to contact your instructor to develop a plan for submission or makeup. Acceptance of late work is at the discretion of the instructor.

Synthesis Activity (Online Discussion) Rubric:
Timely participation in the discussions is intended to maximize your learning and is a key requirement of the course. Your response to the Synthesis Activity Discussion Forum Questions is required by the end of the week when they are due (dates are listed on the syllabus). These responses are considered as part of your grade and consequently should be thoughtful syntheses of the course readings and activities and reflection about how the concepts can be applied to problems of practice. It is also recommended that you post your response early in the week and check back once or twice to respond to a peer. In doing so, you are participating in the community of practice that includes rich discussions among other educators in the field.

The following rubric will be used to assess your participation in the synthesis activities:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Unacceptable</th>
<th>Acceptable</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflect upon material presented and readings</td>
<td>0 Points: Does not reference readings or activities and/or shows minimal or superficial consideration and understanding of the content presented.</td>
<td>1 Point: References the readings or activities and/or shows consideration and understanding of the content presented.</td>
<td>2 Points: References the readings or activities and shows in-depth consideration and understanding of the content presented.</td>
</tr>
<tr>
<td>Synthesis of subject matter with instructional practice</td>
<td>0 Points: Demonstrates minimal consideration of how the content presented can be used to address a challenge of instructional practice.</td>
<td>2 Points: Demonstrates consideration of how the content presented can be used to address a challenge of instructional practice.</td>
<td>3 Points: Demonstrates innovative consideration of how the content presented can be used to address a challenge of instructional practice.</td>
</tr>
<tr>
<td>Quantity and timeliness</td>
<td>0 Points: Synthesis and/or comments to peers are not posted on time.</td>
<td>1 Point: Synthesis and comments to peers are posted on time.</td>
<td></td>
</tr>
</tbody>
</table>
**Session 6 - Multiple Means of Representation:** The learner will demonstrate the ability to evaluate an existing lesson to determine whether it includes elements of UDL as outlined in the UDL framework and will explain why.

<table>
<thead>
<tr>
<th>Guideline 1: Provide options for perception</th>
<th>Does not meet expectations</th>
<th>Meets some expectations</th>
<th>Meets all expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Points: Demonstrates little understanding of how the lesson does or does not provide options for perception.</td>
<td>1 Point: Demonstrates a limited or partial understanding of how the lesson does or does not provide options for perception.</td>
<td>2 Points: Demonstrates an in-depth understanding of how the lesson does or does not provide options for perception.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guideline 2: Provide options for language, mathematical expressions, and symbols</th>
<th>Does not meet expectations</th>
<th>Meets some expectations</th>
<th>Meets all expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Points: Demonstrates little understanding of how the lesson does or does not provide options for language, mathematical expressions, and symbols.</td>
<td>1 Point: Demonstrates a limited or partial understanding of how the lesson does or does not provide options for language, mathematical expressions, and symbols.</td>
<td>2 Points: Demonstrates an in-depth understanding of how the lesson does or does not provide options for language, mathematical expressions, and symbols.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Guideline 3: Provide options for comprehension</th>
<th>Does not meet expectations</th>
<th>Meets some expectations</th>
<th>Meets all expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Points: Demonstrates little understanding of how the lesson does or does not provide options for comprehension.</td>
<td>1 Point: Demonstrates a limited or partial understanding of how the lesson does or does not provide options for comprehension.</td>
<td>2 Points: Demonstrates an in-depth understanding of how the lesson does or does not provide options for comprehension.</td>
<td></td>
</tr>
</tbody>
</table>

**Session 9 - Multiple Means of Action and Expression:** The learner will demonstrate the ability to evaluate an existing lesson to determine whether it includes elements of UDL as outlined in the UDL framework and will explain why.

<table>
<thead>
<tr>
<th>Guideline 1: Provide options for physical action</th>
<th>Does not meet expectations</th>
<th>Meets some expectations</th>
<th>Meets all expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Points: Demonstrates little understanding of how the lesson does or does not provide options for physical action.</td>
<td>1 Point: Demonstrates a limited or partial understanding of how the lesson does or does not provide options for physical action.</td>
<td>2 Points: Demonstrates an in-depth understanding of how the lesson does or does not provide options for physical action.</td>
<td></td>
</tr>
</tbody>
</table>
**Guideline 2: Provide options for expression and communication**

<table>
<thead>
<tr>
<th>0 Points:</th>
<th>1 Point:</th>
<th>2 Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates little understanding of how the lesson does or does not provide options for expression and communication.</td>
<td>Demonstrates a limited or partial understanding of how the lesson does or does not provide options for expression and communication.</td>
<td>Demonstrates an in-depth understanding of how the lesson does or does not provide options for expression and communication.</td>
</tr>
</tbody>
</table>

**Guideline 3: Provide options for executive functions**

<table>
<thead>
<tr>
<th>0 Points:</th>
<th>1 Point:</th>
<th>2 Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates little understanding of how the lesson does or does not provide options for executive functions.</td>
<td>Demonstrates a limited or partial understanding of how the lesson does or does not provide options for executive functions.</td>
<td>Demonstrates an in-depth understanding of how the lesson does or does not provide options for executive functions.</td>
</tr>
</tbody>
</table>

**Session 11 - Multiple Means of Engagement:** The learner will demonstrate the ability to evaluate an existing lesson to determine whether it includes elements of UDL as outlined in the UDL framework and will explain why.

<table>
<thead>
<tr>
<th>Does not meet expectations</th>
<th>Meets some expectations</th>
<th>Meets all expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guideline 1: Provide options for recruiting interest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 Points:</td>
<td>1 Point:</td>
<td>2 Points:</td>
</tr>
<tr>
<td>Demonstrates little understanding of how the lesson does or does not provide options for recruiting interest.</td>
<td>Demonstrates a limited or partial understanding of how the lesson does or does not provide options for recruiting interest.</td>
<td>Demonstrates an in-depth understanding of how the lesson does or does not provide options for recruiting interest.</td>
</tr>
</tbody>
</table>

**Guideline 2: Provide options for sustaining effort and persistence**

<table>
<thead>
<tr>
<th>0 Points:</th>
<th>1 Point:</th>
<th>2 Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates little understanding of how the lesson does or does not provide options for sustaining effort and persistence.</td>
<td>Demonstrates a limited or partial understanding of how the lesson does or does not provide options for sustaining effort and persistence.</td>
<td>Demonstrates an in-depth understanding of how the lesson does or does not provide options for sustaining effort and persistence.</td>
</tr>
</tbody>
</table>

**Guideline 3: Provide options for self-regulation**

<table>
<thead>
<tr>
<th>0 Points:</th>
<th>1 Point:</th>
<th>2 Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates little understanding of how the lesson does or does not provide options for self-regulation.</td>
<td>Demonstrates a limited or partial understanding of how the lesson does or does not provide options for self-regulation.</td>
<td>Demonstrates an in-depth understanding of how the lesson does or does not provide options for self-regulation.</td>
</tr>
</tbody>
</table>

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Final Assignment Scoring Rubric:

<table>
<thead>
<tr>
<th>EVALUATE: Indicate the goals, assessments, methods and materials used in the original lesson.</th>
<th>Incomplete Understanding</th>
<th>Basic Understanding</th>
<th>Target Understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVALUATE: Indicate the goals, assessments, methods and materials used in the original lesson.</td>
<td>0 Points:</td>
<td>2 Points:</td>
<td>4-5 Points:</td>
</tr>
<tr>
<td>0 Points:</td>
<td>Demonstrates a weak or no understanding of elements of a lesson by omitting or misidentifying some or all of the elements (goals, assessments, materials and methods).</td>
<td>Demonstrates a good understanding of elements of a lesson by identifying most of the elements (goals, assessments, materials and methods) correctly.</td>
<td></td>
</tr>
<tr>
<td>DESIGN: Briefly describe how you will adjust goals, assessments, materials and methods and how these changes address learner variability.</td>
<td>0-1 Points:</td>
<td>2-3 Points:</td>
<td>4-5 Points:</td>
</tr>
<tr>
<td>0-1 Points:</td>
<td>Demonstrates a weak or no understanding of how to adjust goals, assessments, materials and methods to address learner variability and/or includes a weak or no description of how these changes address learner variability.</td>
<td>Demonstrates a basic understanding of how to adjust goals, assessments, materials and methods to address some learner variability and provides a basic explanation of how these changes address some learner variability.</td>
<td>Demonstrates complete understanding of how to adjust goals, assessments, materials and methods to address most learner variability.</td>
</tr>
<tr>
<td>DESIGN: Explain which checkpoints will be included in the revised lesson and why. If you decide not to include some checkpoints, explain why they are not being included.</td>
<td>0-1 Points (Representation):</td>
<td>2-3 Points (Representation):</td>
<td>4-5 Points (Representation):</td>
</tr>
<tr>
<td>0-1 Points (Representation):</td>
<td>Demonstrates a weak understanding of how to apply multiple means of representation by applying only a few checkpoints correctly or misapplying the checkpoints and guidelines and/or includes a weak or no description of how these changes address learner variability.</td>
<td>Demonstrates a basic understanding of how to apply multiple means of representation by applying some of the checkpoints correctly and/or providing an explanation of how they address some learner variability.</td>
<td>Demonstrates complete understanding of how to apply multiple means of representation by applying the checkpoints correctly and providing an explanation of how they address a wide range of learner variability.</td>
</tr>
<tr>
<td>0-1 Points (Action and Expression):</td>
<td>2-3 Points (Action and Expression):</td>
<td>4-5 Points (Action and Expression):</td>
<td></td>
</tr>
<tr>
<td>0-1 Points (Action and Expression):</td>
<td>Demonstrates a weak understanding of how to apply multiple means of action and expression by applying only a few checkpoints or misapplying the checkpoints and guidelines and/or includes a weak or no description of how these changes address learner variability.</td>
<td>Demonstrates a basic understanding of how to apply multiple means of action and expression by applying some of the checkpoints correctly and/or providing an explanation of why decisions were made and how they address some learner variability.</td>
<td>Demonstrates complete understanding of how to apply multiple means of action and expression by applying the checkpoints correctly and providing an explanation of why decisions were made and how they address a wide range of learner variability.</td>
</tr>
<tr>
<td>0-1 Points (Engagement):</td>
<td>2-3 Points (Engagement):</td>
<td>4-5 Points (Engagement):</td>
<td></td>
</tr>
<tr>
<td>0-1 Points (Engagement):</td>
<td>Demonstrates a weak understanding of how</td>
<td>Demonstrates a basic understanding of how</td>
<td>Demonstrates a complete understanding of</td>
</tr>
<tr>
<td>SUMMARIZE: Provide a summary of the revised plan; include challenges, solutions and a vision of success.</td>
<td>0-1 Points:</td>
<td>2-3 Points:</td>
<td>4-5 Points:</td>
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<tr>
<td>The summary of the revised plan is difficult to follow and/or unclear how it will address learner variability and/or does not state the potential challenges and solutions.</td>
<td>The summary of the revised plan does not describe the revised lesson completely and/or how it will address learner variability and/or It does not completely state the potential challenges and solutions.</td>
<td>The summary of the revised plan adequately describes the revised lesson and how it will address most learner variability. It also states the potential challenges and solutions.</td>
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<tr>
<th>Presentation of deliverable</th>
<th>0 Points:</th>
<th>1 Point:</th>
<th>4 Points:</th>
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<tr>
<td>The project presentation or media is difficult to follow (is disorganized or does not include enough explanation). The presentation does not helps to demonstrate understanding of how to use UDL to address learning variability.</td>
<td>The project presentation or media is adequately displayed Presentations helps to demonstrate a good understanding of how to use UDL to address a wide range of learner variability.</td>
<td>The project presentation or media is clear and concisely displayed. Presentations helps to demonstrate a good understanding of how to use UDL to address a wide range of learner variability.</td>
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COURSE CONTENT/TOPICAL OUTLINE

Session 1: Introduction to the Course: Synchronous Web Conference Session

Introductory session: This session includes a synchronous (real-time) web conference session that consists of an opportunity to meet the instructor and to learn about the different resources and technologies that will be used in this course. The session will include a tour of Blackboard and the National Center for UDL website. The session will include interactive polls and an opportunity to ask questions.

Session Activity:
In this online format, it is difficult to get to know one another. In order to develop this learning community, please go to the Blackboard and add your profile. Please take the time to describe details that are relevant to this course. For example, please let the other participants know if this is your first online course, what your goal is in taking the course and what your role in the school is (e.g. 4th grade general educator, music teacher, principal, special education director) and your reason for taking the course. You can also tell people a little about your interests and hobbies and upload a picture of yourself. Read and familiarize yourself with the profiles of others before the web conference.

Pause and Reflect: After reading some of the profiles of other participants, consider the makeup of this group. How much variability exists among the different people in the group?

NOTE: If you cannot attend the session, you are required to watch the recording (posted to Blackboard within 48 hours) and summarize it for your instructor. You can choose the way you want to do this. For example: you can write a 1-page essay, create a podcast, a PowerPoint, etc. This needs to be submitted to your instructor within 7 days.

Session 2: Universal Design for Learning: A Paradigm Shift

UDL maintains that the primary impediment to achievement of many learners is an inflexible, “one-size-fits-all” curriculum that is not flexible enough to deal with learner variability. UDL asserts that the onus for dealing with this variability should be on the curricula (rather than on the learners). This premise represents a conceptual shift from traditional ways of viewing learners and the curriculum used to teach. In this session, you will be asked to consider the new way of viewing ability as existing at the intersection of the resources the person has and the demands of the instructional environment.

Session Goals:
1. Participants will examine their current beliefs about the nature of ability.
2. Participants will understand that ability is determined by the interaction of individual variability and the learning context.

Watch & Read:
- **UDL Theory & Practice, Chapter 1 - Revisioning Education through UDL (pp. 1-4)
- **Questions to guide your understanding**: How did early education develop into a one-size-fits-all approach? How did CAST’s view of students and ability change over time? How did technology play a role in that?
- **Question(s) to guide your understanding**: In what way are Meyer and Rose challenging the reader to think differently about learners, curricula and the idea of disability?
- **Question(s) to guide your understanding**: In what way is the concept of neurodiversity similar or different from what Meyer and Rose are suggesting?
- **The story of colonial Martha’s Vineyard:**
2. Wikipedia article Martha’s Vineyard Sign Language

Questions to guide understanding: This story provides an example of ways that people in the margins influenced an entire community. How did fully including the deaf individuals in island life expand the community’s view of ways to represent knowledge, to use varied strategies for expression and to engage everyone?

Session Activity:
Try one or two of the following activities: (These activities require Flash 5 player, or a later version. Click here to get Flash plugin):
- Visual Activity
- Auditory Activity
- Decoding Activity
- Memory Activity
- Graphomotor Activity
- Composition Activity
- Arithmetic Activity
- Spatial Activity
- Sequence Activity

Pause and Reflect: Consider how the experience in these activities illustrates that ability is a factor of resources and the demands of the context.

Synthesis Activity (Online Discussion):
NOTE: Be sure to explore and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Discuss the relationships between the story of Martha’s Vineyard, the concept of neurodiversity and the “The Future is in the Margins.” In what way might the story of colonial Martha’s Vineyard provide a model for thinking about inclusive classrooms? What are the challenges for educators in providing multiple ways of representing information and allowing learners to express information? How do you think doing so could help all learners? In what ways do assumptions about inclusion, community and communication strategies affect how you address learner variability? Be sure to read other participants’ responses and ask them to either clarify or elaborate on a point that they make or offer your own insight into their responses.

Dive Deeper (optional):
Everyone Here Spoke Sign Language: Hereditary Deafness on Martha’s Vineyard by Nora Groce

Session 3: Research from the Learning Sciences and Introduction to Learner Variability

UDL is based on recent research in the learning sciences that has shown that learner variability is universal. This session examines the ways that, when educators shift their focus toward designing curriculum that accommodates the widest spectrum of learners from the beginning, rather than retrofitting it to accommodate individual learners, the result is curricula that can respond to learner variability.

Session Goals:
1. Participants will understand that neural networks vary across individuals.
2. Participants will understand that the UDL guidelines are a series of levers for addressing learner variability.
Watch & Read:

- **UDL Theory and Practice, Chapter 3 - The Variability of Learners (pp. 29-32)**
  
  **Questions to guide your understanding:** Is variability of learners rather than the disability a more productive approach for educators? Why?

- Watch this brief video where David Rose describes how the concept of UDL came to fruition (1:57): [http://www.udlcenter.org/resource_library/videos/udlcenter/udl#video2](http://www.udlcenter.org/resource_library/videos/udlcenter/udl#video2)
  
  **Questions to guide your understanding:** How did working with learner variability provide the basis for the concept of UDL?

- **UDL at a Glance** A short (4:38) video created by CAST that illustrates the three principles of Universal Design for Learning.
  
  **Questions to guide your understanding:** How can the UDL framework help educators address learner variability?

Session Activity:

Think about how you currently address learner variability. How difficult is it? How does it make you feel when some learners are successful and some are not? In what ways do your assumptions about learning lead you to address learner variability in the way that you do?

Choose ONE of the following metaphors, read or view the additional information, then reflect on your choice in the discussion forum.

1. Addressing learner variability is like **eating ice cream with a fork**. In what ways do assumptions about adapting, supporting, scaffolding and accommodating learning relate to the use of special devices and assistive technologies to address learner variability?
   
   *Read What is an ice cream fork?*
   *Read Wahl, L. Assistive Technology: Enhanced Learning for All*

2. Addressing learner variability is like **cleaning a dirty bathroom**. In what ways do assumptions about time, work ethic, effort and perseverance affect how you address learner variability?
   
   *Watch Dirty Bathroom (original link: [http://www.youtube.com/watch?v=3Co2tGFhisc](http://www.youtube.com/watch?v=3Co2tGFhisc))*
   *Read A matter of effort and perseverance*

3. Addressing learner variability is like **teaching your child to drive a car that has a stick shift**. In what ways do assumptions about potential, challenge, frustration, autonomy, competence, and coping skills affect how you address learner variability?
   
   *Watch Erin learns to drive a stick shift: (original link: [http://www.youtube.com/watch?v=nYc9JtyS3jk&feature=related](http://www.youtube.com/watch?v=nYc9JtyS3jk&feature=related))*

Synthesis Activity (Online Discussion):

**NOTE:** Be sure to explore and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Which metaphor did you choose in this week’s session activity? Answer the question below that corresponds to the metaphor you chose and also explain why you chose that metaphor and how your experience addressing learner variability reflects similar emotions to the emotions reflected in the metaphor you chose.
• **Eating Ice Cream with a Fork:** In what ways do assumptions about adapting, supporting, scaffolding and accommodating learning relate to the use of special devices and assistive technologies to address learner variability?

• **Cleaning A Dirty Bathroom** In what ways do assumptions about time, work ethic, effort and perseverance affect how you address learner variability?

• **Teaching Your Child To Drive A Car That Has A Stick Shift:** In what ways do assumptions about potential, challenge, frustration, autonomy, competence, and coping skills affect how you address learner variability?

**Session 4: Introduction to UDL as a Framework for Planning to Address Learner Variability**

In this session, you will be introduced to Universal Design for Learning (UDL). UDL provides a framework for understanding the differences among learners (learner variability) and to plan ahead for this. This framework helps to make explicit the ways in which learners are likely to vary—taking all of the dimensions along which learners are naturally varied and providing educators with practical ways to apply that understanding to the learning environment in order to allow more learners access to appropriate and challenging learning experiences.

**Survey:**

At this point in the course, take a survey (see link on Blackboard) to give your instructor some feedback on how the course is going so far answering the following questions:

- Overall, how do you feel about the course so far? (scale of 1-10)
- Do you feel that you are getting: enough, too much or not enough feedback?
- Do you feel that the feedback is instructive enough to be helpful in improving your work in the discussions afterward? If not, how can it be improved?
- Do you feel the interaction in the discussions is helping you to think more deeply about the content?

**Session goals:**

1. Participants will understand the way that neural networks vary across individuals.
2. Participants will understand that the UDL guidelines are a series of levers that can help educators address learner variability.

**Watch & Read:**

- **UDL Series: Learner Variability and UDL** (15:36) interactive video and PowerPoint
  
  **Questions to guide your understanding:** Why are curricula limited if they are designed for the 'average' learner? What makes learner variability systematic? Why is it important for educators to know about systematic learner variability?

  
  **Question(s) to guide your understanding:** How do you think a learners’ native culture affect the things he or she pays attention to, the way he or she takes in information and constructs new meaning?

- Rose, D., Gravel, J.W., and Domings, Y.M. (2010). *UDL Unplugged: The Role of Technology in UDL*

**UDL and Technology**

**Questions to guide understanding:** To what extent does digital technology make implementing UDL easier?

**Session Activities:**

- **UDL online: Introduction section** (this section has several pages—read and do the activities from *The Challenge: Learner Diversity to UDL and the Learning Brain*).

  NOTE: UDL online is a multimedia module that is used as part of post-secondary teacher training. It is set up like an online, multi-media textbook. The left navigation bar is similar to the table of contents. You will know
which section you are in because it is highlighted in the navigation bar. Each section contains several pages. You can start at the link above and then advance the pages by clicking on the arrows on the top and bottom right of each page. NOTE: Be sure to complete the section all the way to the page entitled: UDL and the Learning Brain.

- Watch this short video UDL principles and Practice (6:36) (original link: http://www.youtube.com/watch?v=pGLTJw0GSxk&feature=related)

Pause and reflect:
How do you think offering options can help educators meet learner variability in the classroom?

Synthesis Activity (Online Discussion):
NOTE: Be sure to explore and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Choose ONE to discuss:

1. How can designing flexible curricula for the learners “in the margins” help us design learning experiences for all learners? What challenges exist in doing so? Do you think that designing curricula in this way affects your ability to accurately assess learners? Provide an example from your practice to help illustrate and support your answer.

   OR

2. How do you think a learners’ native culture affect the things he or she pays attention to, the way he or she takes in information and constructs new meaning? Can you think of examples where this may have happened in your own classroom or in a classroom you were observing?

   OR

3. Some people feel that digital media and technology are a requirement for UDL implementation. In what ways do you agree or disagree? Provide examples for some non-digital ways that you might alter materials and methods in a classroom. Compare your examples with those offered by other participants.

Dive Deeper (optional):

Session 5: Learner Variability in the Recognition Networks
This session will explore the recognition networks - parts of the brain that are involved in pattern recognition: e.g. the variability that exists in how individuals identify, categorize, and make connections between what we see, hear and read. Beyond simple recognition, these networks help us to build knowledge: develop concepts, understand meaning and connect new learning to knowledge we already have and making predictions based on that knowledge.

Session Goals:
1. Participants will be able to explain how the recognition networks of the brain are involved in how we gather information, integrate it into concepts, make connections between them, etc.
2. Participants will be able to describe the way that recognition networks vary across individuals and the challenges that this presents for educators.
Watch & Read:

- **UDL Theory and Practice: The Variability of Learners:** Recognition Networks (pp. 37-40).

  **Question(s) to guide your understanding:** How does understanding the variability in recognition networks help educators in designing curriculum to meet the needs of all learners?

- **Are Math Skills Built into the Human Brain? An Interview with Veronique Izare and Brian Butterworth**

- **Numbers Guy: Are Our Brains Wired for Math?** An Interview with Stanislas Dehaene

  **Question(s) to guide your understanding:** How do you think the different deficits described in these articles might impact math learning in general? Would they impact all levels of the curriculum?

Session Activities:

Do the following illusion activities:

- **The Thatcher Illusion:** an example of an inverted face illusion with a brief explanation.

- **Illusion Works:** A “collection of optical and sensory illusions” presented at two levels: introductory and advanced. The introductory level includes simple explanations of the illusions, and the advanced level includes more complex explanations.

  **Pause and reflect:** When you were doing the illusion activity(s), think about how your recognition networks were processing the information. How do you think it might have differed from the other participants in the course?

- When you watch this video of the Antiques Roadshow, think about how background knowledge differs between the two men in the video. How does the individual variability in the level of background knowledge impact the way they each view the blanket? (original link: [http://www.youtube.com/watch?v=wlkYn39i4Fw](http://www.youtube.com/watch?v=wlkYn39i4Fw))

  **Pause and reflect:**

  How do you think that background knowledge is connected to the recognition networks? How might the variability among learners in a classroom impact the way they learn? What kinds of things contribute to the variability?

Synthesis Activity (Online Discussion):

**NOTE:** Be sure to explore and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

**Choose ONE:**

- How do you think experience impacts the recognition networks? How does learner variability in the recognition networks present challenges for educators?

  **OR**

- Consider the importance of the recognition networks to learning. Can you think of ways that you have provided or observed another educator who provide an alternate representation that helped more learners develop concepts, understand meaning and connect new learning to their own background knowledge? What factors should educators consider when selecting different representations?

**Dive Deeper (optional)**

[Mathematics and the Brain – paper by Brian Butterworth](http://example.com)
Session 6: The Recognition Networks and Multiple Means of Representation

This session connects learner variability in the recognition networks with the UDL principle that addresses how information is represented or presented (the ‘what’ of learning). This principle guides educators to provide multiple means of representation. During this session you will learn about identifying barriers to representation and providing options that give learners various ways of acquiring information and knowledge.

Session Goals:

1. Participants will be able to explain how the UDL principle—Multiple Means of Representation—helps educators address the variability in learners’ recognition networks.
2. Participants will demonstrate understanding of how the principle Multiple Means of Representation can be used as a lens to evaluate curricula for barriers and elements of UDL.

Watch & Read:

- **UDL Theory and Practice** - Universal Design for Learning & Multiple Means of Representation (pp. 48-51 & 54)

  **Questions to guide your understanding:** What impact could representing information in multiple ways have on students' understanding or on their engagement with the subject?

- **UDL Guidelines-version 2.0** (read this brief introductory page and take a look at the graphic of the guidelines. This will come up multiple times in the course, so it is a good idea to take a long look at the way the guidelines are set up)

  **Questions to guide your understanding:** How can using Multiple Means of Representation help you address learner variability?

- An overview of Accessible Instructional Materials (AIM) and the National Instructional Materials Accessibility Standard (NIMAS) an [interview with Skip Stahl at CAST](http://www.cast.org) (6:54).

- AIM: Simply Said (3:43): this [video](http://www.youtube.com/watch?v=JcPIMlOJJk) is a collaboration between the PACER Center and the AIM Center. It's a quick video on Accessible Instructional Materials (AIM): [http://www.youtube.com/watch?v=JcPIMlOJJk](http://www.youtube.com/watch?v=JcPIMlOJJk)

  **Questions to guide your understanding:** AIM fits nicely into the principle Provide Multiple Means of Representation. How can AIM provide access to instructional content to learners for who printed text is a barrier? Do you think AIM could be useful to learners other than those who qualify for copyright exemption? For whom and how so?

Session Activity:

**UDL Online Section - Multiple Means of Representation** (5 pages): In this section of UDL Online you will watch a short video demonstrating a digital learning tool. After watching the video, click on the Activity tab for some guided practice using the guidelines to evaluate the tool shown in the video. After you complete the activity, click on the “examples” button to check your answers.

Pause and Reflect:

How is offering Multiple Means of Representation challenging for educators? Is it possible to challenge learners when using Multiple Means of Representation?

Lesson Analysis and Evaluation Assignment:

1. Download a copy of the [UDL Guidelines Lesson Analysis Worksheet for Representation](http://www.cast.org). Familiarize yourself with the principle, Provide Multiple Means of Representation, along with the associated guidelines and checkpoints. To explore each checkpoint, go to the UDL guidelines 2.0 – Organizer link to examples where you can find explanations and links to examples of how to implement the checkpoints.
2. Choose ONE of the following lessons (from the Interactivate Website):

      **Goal:** Students learn about area and the units used to measure area using a variety of materials including computer applets.

      **Goal:** This lesson allows students to examine tessellations and their geometric properties. The activity and discussion may be used to develop students' understanding of lines, planes, angles, and polygons.

   c. **Algorithm Discovery with Venn Diagrams**: [http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/](http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/)
      **Goal:** This lesson is designed to help students learn about algorithms through Venn Diagrams and Box Plots. Students will develop algorithms for solving Venn Diagrams, collect data for each algorithm, and compare the efficiency of each algorithm, using box plots.

      **Goal:** The activity and two discussions that make up this lesson introduce ideas that are the basis of probability theory. By using everyday experiences and intuitive understanding, this lesson gives students a gradual introduction to probability.

3. Read through the lesson.

4. Try out the activities in the links.

5. Fill out the top of the second page of the UDL Guidelines Lesson Analysis Worksheet for Representation with your name, the lesson title (and URL if applicable), the lesson goal, and a brief description of the lesson.

6. Complete the rest of the UDL Guidelines Lesson Analysis Worksheet for Representation using the lesson you have chosen for analysis. Consider each checkpoint contained within the UDL Guidelines and decide whether that checkpoint is **present**, **not present**, or if you are **unsure** about whether or not it is present in the lesson. Be sure to include any additional **comments** about how the lesson does or does not address the checkpoint. It is not sufficient to simply list the checkpoints that are present or not present. You need to provide an explanation of why.

7. Save your responses on the worksheet. Be sure to indicate which lesson your chose at the top of the page. Save As: your first initial, last name (e.g. jsmith.doc). Upload the file to the Blackboard assignment page or email your instructor to make alternative arrangements.

   **NOTE:** Refer to the **rubric** for grading criteria. Models will be available on Blackboard.

### Session 7: Synchronous Web Conference Session

**Session Goals:**
1. Participants will understand that the UDL guidelines are levers for addressing learner variability.
2. Participants will understand the way that the UDL framework supports the development of expert learners.

**Required Reading (we will be discussing this in the session):**

- [Massachusetts Tiered System of Support](https://www.doe.mass.edu/mtss/) (MTSS) PDF

**Questions to guide your understanding:** Now that you know more about UDL and the MTSS, how do you think UDL can be used to support the MTSS?
Session note: This synchronous web conference session is intended to allow you to participate and share your reflections and new understandings with other participants. During the session, we will review sessions 1-6, go over the Recognition Principle Lesson Analysis Worksheet activity, provide a summary of the discussions, highlight the structure of the guidelines, review the supporting neural networks and the goal of developing expert learners.

Pause and Reflect: How has any of the content so far impacted your teaching, the preparation of your lessons, or your thinking about your students? What do you observe in your class; do you observe your students differently?

NOTE: If you cannot attend the session, you are required to watch the recording (posted to Blackboard within 48 hours) and summarize it for your instructor. You can choose the way you want to do this. For example: you can write a 1-page essay, create a podcast, a PowerPoint, etc. This needs to be submitted to your instructor within 7 days.

Session 8: Learner Variability in the Strategic Networks
This session will explore variability in individual strategic networks: the parts of the brain involved in planning and performing tasks: e.g. the variability in the way that individuals organize tasks, express ideas, or solve a problem. These networks are important for developing strategies for learning and expressing what we know.

Session Goals:
1. Participants will be able to explain how the strategic networks of the brain are involved in how we act on information, develop strategies, set goals and express what we know.
2. Participants will be able to describe the way that strategic networks vary across individuals and the challenges that this presents for educators.

Watch & Read:
- UDL Theory and Practice -The Variability of Learners: Strategic Networks (pp. 41-44)
  Question(s) to guide your understanding: What kinds of options could support a class with predictable variations in organizational, executive functioning, and working memory skills?
- UDL online: Strategic Networks section (2 pages) UDL online is a multimedia module that is used as part of post-secondary teacher training. It is set up like an online, multi-media textbook. The left navigation bar is similar to the table of contents. You will know which section you are in because it is highlighted in the navigation bar. Each section contains several pages. You can start at the link above and then advance the pages by clicking on the arrows on the top and bottom right of each page. NOTE: Be sure to complete the section all the way to the end of the summary.
  Question(s) to guide your understanding: How do you think using a variety of media help to meet the needs of the strategic networks of all learners?
- Video about the life of Paul Smith. Born in 1921 with cerebral palsy, Paul Smith was kept out of school, but not out of learning; this biographical video describes his art and life.
  Question(s) to guide your understanding: How important were Paul Smith’s strategic networks in providing him with a way to express himself through his art? If he were included, do you think Paul would have been successful in the schools of the 30’s and 40’s? Would he be successful in the schools of today?

Session Activities:
Go to the following sites and try at least TWO of these activities.
- Selective Attention Activity: follow the directions on the beginning of the video. This is a test of selective attention
- The Tower of Hanoi, a mathematical puzzle that tests strategic planning. (try changing the number of disks and see if you can come up with a general strategy)
- Sudoku: Try different levels of Sudoku and analyze the strategies you use. Do you develop new ones? Compare them to the ones listed HERE.
Pause and Reflect:
When you were exploring these activities, what kinds of strategies did you develop as you worked the problems or puzzles that were presented? Did your strategies change over time?

Synthesis Activity (Online Discussion):
NOTE: Be sure to explore and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Choose ONE to discuss:

• Consider the importance of the strategic networks to learning. Can you think of examples from your own practice where learners’ strategies were counter to your goals as an educator? How might providing options help to encourage learners to develop strategies that are desirable and help them to achieve the instructional goal?

OR

• Think about specific strategies that you and other educators typically use in their instruction. Can you identify the strengths and weaknesses of each of these in relation to the variability in learners’ strategic networks?

Dive Deeper (optional)
“University of Pittsburgh Scientists Identify How Brain ‘Gets Ready’ to Perform,” University of Pittsburgh Medical Center

Session 9: The Strategic Networks and Multiple Means of Action and Expression
This session connects learner variability in the strategic networks with the UDL principle that addresses how information is acted on or expressed (the ‘how’ of learning). This principle guides educators to provide multiple means of action and expression. This session will help you identify barriers to action and expression and suggest options for physical action, expression, communication and executive function so that all learners can act on the content and effectively express their understanding.

Survey:
At this point in the course, take another survey (link on Blackboard) to give your instructor some feedback on how the course is going by answering the following questions:

• Overall, how do you feel about the course so far? (scale of 1-10)
• Do you feel that you are getting: enough, too much or not enough feedback?
• Do you feel that the feedback is instructive enough to be helpful in improving your work in the discussions afterward? If not, how can it be improved?
• Do you feel the interaction in the discussions is helping you to think more deeply about the content?

Session Goals:
1. Participants will be able to explain how the UDL principle: Multiple Means of Action and Expression helps educators address the variability in learners’ strategic networks.
2. Participants will demonstrate understanding of how the principle: Multiple Means of Action and Expression can be used as a lens to evaluate curricula for barriers and elements of UDL.

Watch & Read:
• UDL Theory and Practice: Provide Multiple Means of Action and Expression (p. 55)
Question(s) to guide your understanding: How can providing students with options for expression help them learn what strategies work best for them in different contexts?

- **UDL and Expert Learners**
  Question(s) to guide your understanding: What does UDL mean by expert learners? Can you think of ways that an educator might help learners develop into expert learners?

- **“What is executive function?”** By Philip David Zelazo, PhD
  Question(s) to guide your understanding: Why is executive function particularly important in a school setting? How could educators increase or reduce executive function demands in a classroom?

- **“Problem-Solving: Opening Up Problems”** by Jenni Way
  Question(s) to guide your understanding: How does executive function support problem-solving? How could educators increase or reduce executive function demands in math?

**Session Activity:**
UDL Online: [Multiple Means of Action and Expression](http://www.shodor.org/interactivate) Section (3 pages). In this section of UDL Online you will watch a short video demonstrating a digital learning tool. After watching the video, click on the Activity tab for some guided practice using the guidelines to evaluate the tool shown in the video. After you complete the activity, click on the “examples” button to check your answers.

**Pause and Reflect:**
How is offering Multiple Means of Action and Expression challenging for educators? Is it possible to assess learners equitably when they use multiple means of action and expression to show what they know?

**Lesson Analysis and Evaluation Assignment:**

1. Download a copy of the [UDL Guidelines Lesson Analysis Worksheet for Action and Expression](http://www.shodor.org/interactivate). Familiarize yourself with the principle, Provide Multiple Means of Action and Expression, along with the associated guidelines and checkpoints. To explore each checkpoint, go to [the UDL guidelines 2.0 – Organizer link to examples](http://www.shodor.org/interactivate) where you can find explanations and links to examples of how to implement the checkpoints.

1. Choose **ONE** of the following lessons from the InterActivate Website:

      *Goal: Students* learn about area and the units used to measure area using a variety of materials including computer applets

      *Goal: This lesson allows students to examine tessellations and their geometric properties. The activity and discussion may be used to develop students' understanding of lines, planes, angles, and polygons*

   c. **Algorithm Discovery with Venn Diagrams:** [http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/](http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/)
      *Goal: This lesson is designed to help students learn about algorithms through Venn Diagrams and Box Plots. Students will develop algorithms for solving Venn Diagrams, collect data for each algorithm, and compare the efficiency of each algorithm, using box plots.*

      *Goal: The activity and two discussions that make up this lesson introduce ideas that are the basis of probability theory. By using everyday experiences and intuitive understanding, this lesson gives
students a gradual introduction to probability.

2. Read through the lesson.

3. Try out the activities in the links.

4. Fill out the top of the second page of the UDL Guidelines Lesson Analysis Worksheet for Action and Expression with your name, the lesson title (and URL if applicable), the lesson goal, and a brief description of the lesson.

5. Complete the rest of the UDL Guidelines Lesson Analysis Worksheet for Action and Expression using the lesson you have chosen for analysis. Consider each checkpoint contained within the UDL Guidelines and evaluate whether that checkpoint is present, not present, or if you are unsure about whether or not it is present in the lesson. Be sure to include any additional comments about how the lesson does or does not address the checkpoint. It is not sufficient to simply list the checkpoints that are present or not present. You need to provide an explanation of why.

6. Save your responses on the worksheet. Be sure to indicate which lesson your chose at the top of the page.

7. Save As: your first initial, last name (e.g. jsmith.doc). Upload the file to the Blackboard assignment page or email your instructor to make alternative arrangements.

NOTE: Refer to the rubric for grading criteria. Models will be available on Blackboard.

Session 10: Learner Variability in the Affective Networks

This session will explore affective networks – parts of the brain involved in motivation and engagement in learning: e.g. the variability that exists in how individuals’ interest is recruited and sustained or how individuals are challenged, and excited. These networks are important for developing and sustaining interest and attention for learning.

Session Goals:
1. Participants will be able to explain how the affective networks of the brain are involved in motivation and engagement.
2. Participants will be able to describe the way that affective networks vary across individuals and the challenges that this presents for educators.

Watch & Read:
- UDL Theory and Practice: Affective Networks (pp. 33-36)
  Question(s) to guide your understanding: How does understanding the functions of the affective networks help in designing curriculum to meet the needs of all learners? How important do you think affect is in learning? Why?
  Question(s) to guide your understanding: What message are adults sending when they praise children? How can switching the type feedback we give help kids to persist in the face of difficulty?
- Interview with Carol Dweck: Students’ View of Intelligence Can Help Grades (4:28) NPR audio podcast and ‘‘Brainset’ – Neuroscience Examines Carol Dweck’s Theory
  Question(s) to guide your understanding: Was the research on praise surprising to you? If so, how?
- “Researchers say Math Anxiety Starts Young”. Article from Washington Post
**Question(s) to guide your understanding:** How do you view the relative importance of biological vs. social contributions to math anxiety?

**Session Activities:**
- Read “Kids Master Mathematics When They’re Challenged but Supported”
- Complete step 5 and 6 of the Affective Network section of The Three Brain Networks

**Pause and Reflect:**
Why do you think challenging students with difficult math problems might actually engage the affective networks?

**Synthesis Activity (Online Discussion):**
NOTE: Be sure to draw on information and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Do you believe that our emotions have an impact on how we experience the world (e.g. what we see, what we hear, what we do, what we pay attention to)? Why or why not? Provide examples from your own practice to illustrate and support your answer.

**Dive Deeper (optional):**
- “Student Engagement in High School Classrooms from the Perspective of Flow Theory,” Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Steele Shernoff, E. In *School Psychology Quarterly;* Summer 2003; 18, 2; pg. 158-176.
- “Parallel Memories: Putting Emotions Back Into The Brain,” www.edge.org
- “Researchers face up to liars: Expressions speak louder than words,” Cromie, W. J.
- “Why whites of eyes spell ‘danger,’” BBC News
- “Mihaly Csikszentmihalyi: Motivating People to Learn,” Edutopia Staff
- “Flow States and learner Engagement in the Classroom,” Shernoff, D.

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**Session 11: The Affective Networks and Multiple Means of Engagement**
This session connects learner variability in the affective networks with the UDL principle that addresses how learners are motivated and engage with learning (the ‘why’ of learning). This principle guides educators to provide multiple means of engagement. During this session you will learn about how to identify barriers to learner engagement and how to suggest options for learning that recruit interest, sustain effort and persistence, and promote self-regulation.

**Session Goals:**
1. Participants will be able to explain how the UDL principle: Multiple Means of Engagement helps educators address the variability in learners’ affective networks.
2. Participants will demonstrate understanding of how the principle Multiple Means of Engagement can be used as a lens to evaluate curricula for barriers and elements of UDL.

**Watch & Read:**
- UDL Theory and Practice: Provide Multiple Means of Engagement (pp. 52-53)

**Questions to guide your understanding:** How does the UDL principle Multiple Means of Engagement help educators address learner variability in the affective networks of learners?

- UDL guidelines – about this representation
• **UDL guidelines – Multiple Means of Engagement**
  **Question(s) to guide your understanding:** What does UDL mean by developing expert learners?

• **UDL Guidelines Structure**
  **Question(s) to guide your understanding:** What is the logic behind the vertical structure of the UDL guidelines? How does this help us develop expert learners?

• **The Surprising Science of Motivation** – Watch this interesting video (10:47) on the science of motivation.
  **Question(s) to guide your understanding:** Was the research that Dan Pink referenced surprising? Does it change the way you think about motivating learners in your classroom? How do you think this can apply to teaching and learning?

**Session Activities:**

• UDL Online Section – [Introduction](#) (3 pages)
• UDL Online Section - [Multiple Means of Engagement](#) (4 pages)

  In this section of UDL Online you will watch a short video demonstrating a digital learning tool. After watching the video, click on the Activity tab for some guided practice using the guidelines to evaluate the tool shown in the video. After you complete the activity, click on the “examples” button to check your answers.

**Pause and Reflect:**

How do you think the UDL principle “use multiple means of engagement,” relates to the variability in the affective networks of learners? Think about a curriculum that is not flexible and does not provide options that engage all learners. Remember to think about ALL learners (those with special talents and those who struggle with school work).

**Lesson Analysis and Evaluation Assignment:**

1. Download a copy of the [UDL Guidelines Lesson Analysis Worksheet for Engagement](#). Familiarize yourself with the principle, Provide Multiple Means of Engagement, along with the associated guidelines and checkpoints. To explore each checkpoint, go to [UDL Guidelines 2.0 – Organizer links to examples](#) where you can find explanations and links to examples.

2. Choose ONE of the following lessons from the Interactivate Website:
      **Goal:** Students learn about area and the units used to measure area using a variety of materials including computer applets
      **Goal:** This lesson allows students to examine tessellations and their geometric properties. The activity and discussion may be used to develop students' understanding of lines, planes, angles, and polygons
   c. **Algorithm Discovery with Venn Diagrams:** [http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/](http://www.shodor.org/interactivate/lessons/AlgorithmDiscovery/)
      **Goal:** This lesson is designed to help students learn about algorithms through Venn Diagrams and Box Plots. Students will develop algorithms for solving Venn Diagrams, collect data for each algorithm, and compare the efficiency of each algorithm, using box plots.
      **Goal:** The activity and two discussions that make up this lesson introduce ideas that are the basis of probability theory. By using everyday experiences and intuitive understanding, this lesson gives students a gradual introduction to probability.

3. Read through the lesson.
4. Try out the activities in the links.

5. Fill out the top of the second page of the UDL Guidelines Lesson Analysis Worksheet for Engagement with your name, the lesson title (and URL if applicable), the lesson goal, and a brief description of the lesson.

6. Complete the rest of the UDL Guidelines Lesson Analysis Worksheet for Engagement using the lesson you have chosen. Consider each checkpoint contained within the UDL Guidelines and evaluate whether that checkpoint is present, not present, or if you are unsure about whether or not it is present in the lesson. Be sure to include any additional comments about how the lesson does or does not address the checkpoint. It is not sufficient to simply list the checkpoints that are present or not present. You need to provide an explanation of why.

7. Save your responses on the worksheet. Be sure to indicate which lesson your chose at the top of the page. Save As: your first initial, last name (e.g. jsmith.doc). Upload the file to the Blackboard assignment page or email your instructor to make alternative arrangements.

**NOTE:** Refer to the rubric for grading criteria. Models will be available on Blackboard.

**Session 12: The UDL Lesson Planning Process**

This session consists of practical applications of the UDL framework to instructional practice by outlining the UDL Lesson Planning Process. This session unpacks the four elements of curriculum, which CAST defines as goals, assessments, methods and materials.

In order to effectively understand how to design or redesign a lesson plan, it is important to be able to establish and articulate clear goals and to identify each element of the curriculum. With a clearly articulated goal as a guide, it is clear which methods and materials can be used to provide options for recognition, strategic and affective networks and still maintain the integrity of the lesson.

**Session Goal:**

1. Participants will be able to identify the goals, methods, materials, and assessments in a lesson plan.

**Watch & Read:**

- [UDL Theory and Practice, Designing for All: What is a UDL Curriculum?](#) (pp. 68-83)
- [What does it mean to say the curricula are Disabled?](#)
- [How does UDL Address Curricular Disabilities?](#)

**Question(s) to guide understanding:** How does UDL define curriculum? In what way are curricula disabled? How do you think using UDL can address curricular disabilities?

**Session Activity:**

Complete the following multimedia section of UDL online entitled [UDL and Curriculum](#) (13 pages) from the Review page through to the PAL Process Summary page.

In this section of UDL online, you will be introduced to the Planning for All Learners (PAL) process. You will go through activities that help you to think about these facets of the curriculum (goals, methods, materials and assessments). Be sure to complete the section all the way to the end of the summary.

**Pause and Reflect:** The UDL lesson planning process is a methodical way of planning or redesigning a lesson. Think about the strengths that using this approach presents for educators.
Synthesis Activity (Online Discussion):
NOTE: Be sure to draw on information and apply the concepts you are learning from the readings, the activities, and your own experience in answering the questions, include what resonated with you and/or what you found puzzling, are wondering or curious about as a result of the new information. Finally, be sure to include how you think you can apply what you have learned in your practice.

Now that you have almost completed the course, think about the readings and activities for this week in light of everything you have learned. Some of what you have read may feel like a review, but you are not the same educator who contemplated these ideas early in the course. Have your ideas about the ability of the curricula to meet the needs of all learners changed? How so? Be sure to reflect on your experiences in the readings and activities and incorporate that into your answer.

Session 13– Putting it All Together

You will choose a lesson you’ve taught, or observed, or from a website (suggested below), analyze it using the UDL Guidelines, and create a plan for adjusting or revising the lesson to better address the learner variability in your classroom. Use the instructions below for details.

Session Goals:
1. Participants will demonstrate the ability to use the UDL framework to analyze and evaluate lessons for barriers and elements of UDL.
2. Participants will demonstrate the ability to use the UDL framework to create or recreate lessons that address learner variability and support the development of expert learners.

Watch & Read:
UDL Exchange is a place to browse and build resources, lessons and collections. You can use and share these materials to support instruction guided by the UDL principles.
- Go to: Introduction to UDL Exchange. Watch “What is CAST UDL Exchange?”
- Go to: UDL Exchange Feature Guide. Read the UDL Exchange Feature Guide

Session Activities:
1. Explore UDL Exchange
2. Either: Create an Account (in the top right corner) OR sign in to UDL exchange. You can use the same login that you use for the multimedia book we have been using in this course: UDL Theory and Practice.
3. You may decide to use UDL Exchange for your final assignment.

Final Assignment:
You should begin to work on your final assignment.

Directions:
1. Choose a lesson you’d like to adjust or revise to better meet the needs of the learner variability in your classroom. This can be a lesson you’ve observed or taught yourself, or you can pick one from the following websites:
   i. Math Forum
   ii. Interactivate
   iii. Thinkfinity (search for math lesson plans)
2. EVALUATE the existing lesson:
   o Indicate the goals, methods, materials, and assessments used in the original lesson.
Using the UDL Guidelines and their associated checkpoints (Provide Multiple Means of Engagement, Provide Multiple Means of Representation and Provide Multiple Means of Action & Expression), describe which checkpoints are present and which checkpoints are not present in the original lesson.

3. DESIGN the new lesson: Develop a plan for how you might adjust or revise the lesson.
   o Describe how you will adjust the goals, assessments, methods and materials in the revised lesson and how these changes address learner variability.
   o Explain which additional checkpoints will be included in the revised lesson. For the checkpoints that will not be included in your revision, explain why they won’t be included. NOTE: Designing instruction is a thoughtful process. All choices should be made deliberately as a means of helping learners achieve the instructional goal. Although it is not necessary for all checkpoints to be addressed in any particular lesson, but each checkpoint should be considered in your lesson analysis.

4. SUMMARIZE: Provide a summary of your redesigned lesson; include the challenges you might encounter in the revised lesson and ideas about how you will address those challenges;

5. PRESENT your work: The way you choose to present your work is up to you, but remember that the purpose of this assessment is for you to demonstrate your understanding of how to use the UDL framework. Be sure that the medium you choose is selected carefully and set up to clearly demonstrate your understanding. Choose ONE of the options below, or email your instructor to discuss alternatives:
   o Fill out the guided worksheet
   o Use UDL Exchange (a tool for developing UDL lessons)
   o Create a PowerPoint or Prezi presentation (no longer than 10 slides or transitions).
   o Create a Glogster web poster.
   o Create a wiki or website.
   o Produce a video (no longer than 5 minutes).
   o Write a paper (no longer than 5 pages).

   NOTE: See the rubric in the appendix for the criteria that your instructor will use to assess your work.

Dive Deeper (optional):

- Beyond the Text: Comparison chart of e-book and digital talking book (DTB) hardware and software

Session 14: Summary Session: Synchronous Web Conference

Session note: The web conference session is intended to allow you to participate and share your reflections and new understandings with other participants in this synchronous session. This final synchronous session will be a review of the Action & Expression and the Engagement Lesson Analysis Worksheets, a summary of the discussions, a tour of some digital tools and provide time for group reflection and questions about the final assignment.

NOTE: If you cannot attend the session, you are required to watch the recording (posted to Blackboard within 48 hours) and summarize it for your instructor. You can choose the way you want to do this. For example: you can write a 1-page essay, create a podcast, a PowerPoint, etc. This needs to be submitted to your instructor within 7 days.

Assignment:
Your final project is due to your facilitator next week.
READINGS AND RESOURCES:


National Center On Universal Design for Learning, At CAST. (2013). What does it mean to say that curricula are disabled? Retrieved from: http://www.udlcenter.org/aboutudl/udlcurriculum/disabledcurricula


