Course Information	**ITLS 7150—Advanced Seminar: Learning Theory[1]**
	Tuesday, 9:00 a.m.- 11:30 a.m.
	EBLS 243
Instructor Information	Instructor: David F. Feldon, Ph.D. Office: EBLS 243 Phone: (435) 797-0556 Office Hrs: By appointment E-mail: david.feldon@usu.edu
Purpose	Cognitive load theory informs instructional and multimedia design based on current understanding of human cognitive architecture. This seminar will delve deeply into the theory and its basis in empirical evidence. Current critiques and emerging directions for the further development of theory will also be discussed. The course will emphasize analysis of the relevant research and the framing of new studies that may advance the ability of the theory to further advance the field.
Objectives	Students in this course will learn to:

1. Explain the major tenets of cognitive load theory and apply them to the analysis of learning situations.

2. Analyze, interpret, and critique the results of empirical studies testing and expanding aspects of cognitive load theory.

3. Identify, explain, and evaluate critiques of cognitive load theory, including issues related to the measurement of cognitive load.

Expectations of Students

- Actively engage with the course material and find ways to make it relevant to your professional and academic needs and goals
- Challenge statements that are confusing or with which you disagree
- Engage in class dialogue with thoughtfulness, openness, and respect
- Attend class having read and taken notes on the readings due
- Work to develop your writing and speaking skills throughout the course

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[1] Although the course requirements listed in this syllabus will not change, the instructor reserves the right to change assigned readings in order to best accommodate the needs of the students in the course.

Expectations of Instructor	• Available during and outside of class time to address questions and concerns • Will respond to messages and emails within 48 hours • Provide clear explanations of salient principles and theories • Conduct an intellectually challenging and rigorous course
Absences	**If you find it absolutely necessary to be absent from class because of illness or an emergency, you are responsible to master *all* information presented during your absence. Do not ask the instructor to repeat important information—identify a classmate who will help you.** **It is important to understand that the purpose of the lectures is not to explain the readings**. While time will be spent on clarification, most of the material presented in class will serve as an extension of relevant ideas and issues. As such, attendance and participation in class will be necessary aspects of the learning process, in addition to the readings. Consequently, absences should be avoided to prevent you from falling behind and missing information for which you will be responsible.
Administrative Issues	All administrative issues will be handled according to established USU and CEHS policies. Please note that I only give incomplete grades in rare and exceptional cases.
Special Needs	Any student requiring accommodations based on a **disability** is required to register with the Office of Student Disability Services each semester. A letter of verification for approved recommendations can be obtained through OSD.
Required Texts	All readings will be posted in Canvas as PDF files.
Grading	**Assignments more than one week late will not be accepted** unless a student has experienced an extreme emergency (contact the instructor). A paper received from one day to seven days late will receive a one full letter grade reduction. **Presentations cannot be made up.** Only in the most extreme individual circumstances will the instructor modify this policy. Any case involving academic dishonesty will be referred to the University for further action.

Course Requirements	**Credit**
Discussion Facilitation (2)	50%
Final Paper	50%

Assignments   **Discussion Facilitation:**
On dates selected during the first class meeting, you will choose two classes to **take the lead on discussion facilitation** for all assigned readings. The purpose of the assignment is not to provide a summary. Instead, you must understand the collective readings at a deep level to identify the central issues and controversies and formulate driving questions to serve as the focus of the discussion for that day. The instructor will provide support as necessary both prior to and during the facilitation to ensure a successful interaction for the class as a whole. Credit is given on the basis of evident preparation and comprehension of core issues in the readings discussed, not on the success of the class interaction itself. Credit/No Credit.

Final Paper:
The final paper may be either a review of literature (integrative or critical) or a research proposal. Papers should be **approximately 12 single-spaced pages** in length (excluding references) will be required in this course. This is a departure from APA format, but please make the adjustment. You can choose any topic relevant to cognitive load theory. Research proposals will entail a thorough content-oriented literature review and a full explanation of the methodological approach. The literature review topic and/or research question and methodology selected **must be approved by the instructor in an email**. See the course schedule for approval timeline. Graded.

Date	Topic	Discussion Facilitators	Readings Due
Jan 13	Introductions; Scheduling; Overview of CIP Model		
Jan 20	Introduction to Cognitive Load Theory		Sweller et al. (1998); van Merrienboer & Sweller (2005)
Jan 27	Types of Cognitive Load		Sweller (2010); Van Gog, Kester, & Paas (2011); van Merrienboer, Kester, & Paas (2006)
Feb 3	Measurement of Load; Cognitive Efficiency		Antonenko, Paas, Grabner, van Gog (2010); Brunken, Steinbacher, Plass, & Leutner (2002); Camp et al. (2001); Leppink, Paas, van der Vleuten, van Gog, & van Merrienboer (2013);
Feb 10	Expertise Reversal Effect		Kalyuga (2007) Kalyuga, Rikers, & Paas (2012)
Feb 17	NO CLASS		
Feb 24	Critiques of Cognitive Load Theory		Gerjets, Scheiter, & Cierniak (2009); Kalyuga (2011); Schnotz & Kurschner (2007)
Mar 3	Worked Examples, Fading		Renkl Atkinson, & Groβe. (2004); Salden, Aleven, Schwonke, & Renkl (2010); van Gog, Paas, & van Merrienboer (2004)
Mar 10	NO CLASS		
Mar 17	JIT Instruction		Kester, Kirschner, & van Merrienboer (2004; 2006); Salden, Paas, Broers, & van Merrienboer (2004)
Mar 24	Information Transience; Segmentation		Leahy & Sweller (2011); Spanjers, van

			Gog, & van Merrienboer (2012)
Mar 31	NO CLASS		
Apr 7	New Directions in CLT: Evolutionary biology and Creativity		Sweller (2009); Paas & Sweller (2012)
Apr 14	New Directions in CLT: Motivation		Feldon & Chao (2013); Rey & Buchwald (2011); Schnotz et al. (2009)
Apr 21	Review and Synthesis	Roundtable	
Apr 28			Final Paper due via email by midnight

Required References	**Readings**
	Readings will be posted to Canvas and available in PDF format for download.

Antonenko, P., Paas, F., Grabner, R., & van Gog, T. (2010). Using electroencephalography to measure cognitive load. *Educational Psychology Review, 22,* 425-438.

Brunken, R., Steinbacher, S., Plass, J. L., & Leutner, D. (2002), Assessment of cognitive load in multimedia learning using dual-task methodology. *Experimental Psychology, 49,* 109-119.

Camp, G., Paas, F., Rikers, R., & van Merrienboer, J. J. G. (2001). Dynamic problem selection in air traffic control training: A comparison between performance, mental effort, and mental efficiency. *Computers in Human Behavior, 17,* 575-595.

Feldon, D. F. & Chao, J. (2013). *Analysis of experts' omissions during instruction: Impacts on student learning and motivation.* Paper presented at the 15th biennial EARLI conference for Research on Learning and Instruction, Munich, Germany. August, 2013.

Gerjets, P., Scheiter, K., & Cierniak, G. (2009). The scientific value of cognitive load theory: A research agenda based on the structuralist view of theories. *Educational Psychology Review, 21,* 43-54.

Kalyuga, S. (2007). Expertise reversal effect and its implications for learner-tailored instruction. *Educational Psychology Review, 19*(4), 509-539.

Kalyuga, S. (2011). Cognitive load theory: How many types of load does it really need? *Educational Psychology Review, 23,* 1-19.

Kalyuga, S., Rikers, R., & Paas, F. (2012). Educational implications of expertise reversal effects in learning and performance of complex cognitive and sensorimotor skills. *Educational Psychology Review, 24,* 313-337.

Kester, L., Kirschner, P. A., & van Merrienboer, J. J. G. (2004). Timing of information presentation in learning statistics. *Instructional Science, 32,* 233-252.

Kester, L., Kirschner, P. A., & van Merrienboer, J. J. G. (2006). Just-in-time information presentation: Improving learning a troubleshooting skill. *Contemporary Educational Psychology, 31,* 167-185.

Leahy, W., & Sweller, J. (2011). Cognitive load theory, modality of presentation and the transient information effect. *Applied Cognitive Psychology, 25,* 943-951.

Leppink, J., Paas, F., Van der Vleuten, C. P. M., van Gog, T., & van Merrienboer, J. J. G. (2013). Development of an instrument for measuring different types of cognitive load. *Behavioral Research, 45,* 1058-1072.

Paas, F., & Sweller, J. (2012). An evolutionary upgrade of cognitive load theory: Using the human motor system and collaboration to support the learning of complex cognitive tasks. *Educational Psychology Review, 24,* 27-45.

Renkl, A., Atkinson, R. K., & Groβe, C. S. (2004). How fading worked solution steps works—A cognitive load perspective. *Instructional Science, 32,* 59-82.

Rey, G. D., & Buchwald, F. (2011). The expertise reversal effect: Cognitive load and motivational explanations. *Journal of Experimental Psychology: Applied, 17,* 33-48.

Salden, R., Aleven, V., Schwonke, R., & Renkl, A. (2010). The expertise reversal effect and worked examples in tutored problem solving. *Instructional Science, 38,* 289-307.

Salden, R., Paas, F., Broers, N. J., & van Merrienboer, J. J. G. (2004). Mental effort and performance as determinants for the dynamic selection of learning tasks in air traffic control training. *Instructional Science, 32,* 153-172.

Schnotz, W., Fries, S., & Horz, H. (2009). Motivational aspects of cognitive load theory. In M. Wosnitza, S. A. Karabenick, A. Efklides, & P. Nenniger (Eds.), *Contemporary motivation research: From global to local perspectives* (pp. 69-96). Cambridge, MA: Hogrefe.

Schnotz, W., & Kurschner, C. (2007). A reconsideration of cognitive load theory. *Educational Psychology Review, 19,* 469-508.

Spanjers, I. A., van Gog, T., & van Merrienboer, J. J. G. (2012). Segmentation of worked examples: Effects on cognitive load and learning. *Applied Cognitive Psychology, 26,* 352-358.

Sweller, J. (2009). Cognitive bases of human creativity. *Educational Psychology Review, 21,* 11-19.

Sweller, J. (2010). Element interactivity and intrinsic, extraneous, and germane cognitive load. *Educational Psychology Review, 22,* 123-138.

Sweller, J., van Merriënboer, J. G., & Paas, F. G. (1998). Cognitive architecture and instructional design. *Educational Psychology Review, 10*, 251-296.

van Gog, T., Paas, F., & van MErrienboer, J. J. G. (2004). Process-oriented worked examples: Improving transfer performance through enhanced understanding. *Instructional Science, 32,* 83-98.

van Gog, T., Kester, L., & Paas, F. (2011). Effects of concurrent monitoring on cognitive load and performance as a function of task complexity. *Applied Cognitive Psychology, 25,* 584-587.

van Merrienboer, J. J. G., Kester, L., & Paas, F. (2006). Teaching complex rather than simple tasks: Balancing intrinsic and germane load to enhance transfer of learning. *Applied Cognitive Psychology, 20,* 343-352.

van Merrienboer, J. J. G., & Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions. *Educational Psychology Review, 17,* 147-177.