

**CI 541**  
**Learning in Science**  
College of Education - Fall 2019  
University of Illinois at Urbana-Champaign

Saadeddine (SAAD) Shehab  
Instructor  
[shehab2@illinois.edu](mailto:shehab2@illinois.edu)

**Course Description**

This course focuses on several theories of how students learn. Since a major focus of science teachers is on helping students learn about the science ideas they teach, it is important to develop a clear view of the nature of that learning and the best ways to support that learning. The course begins with a focus on behaviorism, a theory that was dominant in the US for much of the 20th century and that still exerts a strong influence on educational practice. The course then moves on to examine theories that were contemporary with the rise of behaviorism but that were critical of behaviorist tenets. These theorists were instrumental in the rise of modern theories of constructivism, the currently dominant view of learning in science, which focuses on students' development of understanding and underlies the Next Generation Science Standards. The course then takes a more in-depth look at views of constructivism and their implications for instruction and assessment. My hope is that throughout the course, in both synchronous and asynchronous discussions, each of you will come to a refined, reasoned, and supported view of learning in science that will be powerful both in instructional planning as well as moment-by-moment instructional decision making.

**Course Readings**

The course relies on a set of three to four weekly readings that will be posted on Moodle. You are expected to download and read the readings for each week. Bring your questions, thoughts, and reflections about the readings to the synchronous sessions.

**Course Requirements**

1. *Attendance and participation in synchronous sessions:* Participation in ZOOM sessions is crucial both for your own learning and for enriching the experience of everyone in the class. As such you will be expected to attend all ZOOM sessions and to voice your ideas on the readings and other issues brought up for discussion. The dates of the synchronous sessions are listed in the *Course Schedule* below.
2. *Weekly readings and asynchronous discussion of ideas:* There are two parts to this requirement. In the first part (the initial posting), for each reading discuss critically one or more central ideas from the reading, drawing on specifics of the reading to formulate coherent arguments about the central idea(s). In the second part, react to some of your classmate's postings, discussing reasons for your agreement or disagreement with points raised. Feel free to refer to points made by initial posts as well as points made by others reacting to initial posts. Initial postings are due by 5:00 PM the Sunday before the synchronous session discussing the readings. Reactions to classmates' postings are due by

9:00 AM the Tuesday of the synchronous session (all times Central). All readings are listed in the *Course Schedule* below.

3. *Mini Assignments:* There will be **FIVE** mini assignments that are meant to help you make progress on your Semester Project. These assignments will be submitted by 11:59 PM the Friday of the synchronous session (all times Central). All mini assignments are listed in the *Course Schedule* below.
4. *Semester Project:* Your semester project will be a draft of a journal article that will provide a science teacher with a detailed description of a science activity that can be implemented in a face-to-face science classroom. The article must include a teaser that hooks the reader to the activity, an introduction that introduces the reader to the content and the purpose of the activity, connections to the Next Generation Science Standards (NGSS), a summary of the Pre-Design Process of the activity, and a description of the materials, duration, grade level, instructional model, step-by-step procedure, any appropriate assessment tools, and the issues and challenges that a teacher may encounter when implementing the activity. The final draft of the article will be submitted on Sunday October 20<sup>th</sup> by 11:59 PM.

## Evaluation

Activity	Percent of Final Grade
Electronic Discussions of Readings	25%
Mini Assignments	50%
Semester Project	25%

Letter grades will be assigned based on the percentage of total points earned for the course.

Grading Scale (%)	
94-100	A
90-93	A-
87-89	B+
84-86	B
80-83	B-
77-79	C+
74-76	C
70-73	C-
67-69	D+
64-66	D
60-63	D-
0 – 59	F

## Academic Integrity

All written work in this course must be your own. Please use proper citation and standard writing conventions (e.g., APA) to protect yourself against accusations of academic dishonesty. Plagiarism is not acceptable and will result in a failing grade, subject to further inquiry and discipline not excluding academic probation and expulsion. Please refer to the University of Illinois policy on academic integrity for more information:

[http://www.admin.illinois.edu/policy/code/article1\\_part4\\_1-401.html](http://www.admin.illinois.edu/policy/code/article1_part4_1-401.html)

Please also refer to the College of Education statement and policy on Academic Integrity:

<http://education.illinois.edu/edpsy/about/academic-integrity>

## Course Schedule

Week	Date	Topic(s)	Mini Assignment
1	August 26 <sup>th</sup>	Introductions Syllabus Exploring the Role of Learning Theories in Shaping the NGSS	Selecting your Project Title + Content + Connecting to Standards  <b>DUE: Friday August 30<sup>th</sup> @ 11:59 PM</b>
2	September 3 <sup>rd</sup>	Behaviorism	
3	September 10 <sup>th</sup>	Cognitive Science	Conducting Interviews Downloading results Insights + how might we statements Ideas  <b>DUE: Friday September 13<sup>th</sup> @ 11:59 PM</b>
4	September 17 <sup>th</sup>	Constructivism	
5	September 24 <sup>th</sup>	Theory-Supported Instructional Models – I	Activity Details  <b>DUE: Friday September 27<sup>th</sup> @ 11:59 PM</b>
6	October 1 <sup>st</sup>	Theory-Supported Instructional Models – II	Theory Supported Instructional Model  <b>DUE: Friday October 4<sup>th</sup> @ 11:59 PM</b>
7	October 8 <sup>th</sup>	Assessment	Assessment Tools  <b>DUE: Friday October 11<sup>th</sup> @ 11:59 PM</b>
8	October 15 <sup>th</sup>	Current Issues in Science Teaching and Learning	