

# LEARNING SCIENCES (LRN\_SCI)

## **LRN\_SCI 401-0 Knowledge Representation for the Learning Sciences (1 Unit)**

Theoretical and methodological techniques for knowledge representation, primarily as practiced by cognitive scientists. Application of these techniques to issues of learning that are of interest to researchers in the learning sciences.

## **LRN\_SCI 402-0 Social Dimensions of Teaching & Learning (1 Unit)**

Students' relationships with one another and with teachers in school and nonschool settings. Implications for classroom instruction of social learning theory, student diversity, classroom climate, cooperative and competitive goal structures, and processes of attribution and achievement motivation.

## **LRN\_SCI 403-0 Foundations of the Learning Science (1 Unit)**

Cognitive and social science theories of how people learn to understand, reason, and solve problems. Implications for the design of classroom learning environments; learning in real scenarios for investigating central issues in cognitive science. Learning in mathematics, science, reading/writing, and informal reasoning.

## **LRN\_SCI 404-0 Methods and Epistemologies for the Study of Learning I (1 Unit)**

This course focuses on the development of research questions and understanding the range of possible methodological approaches to understanding learning based on those questions.

## **LRN\_SCI 405-1 Methods and Epistemologies for the Study of Learning II (1 Unit)**

## **LRN\_SCI 410-0 Quantitative Methods I: Probability and Statistics (1 Unit)**

## **LRN\_SCI 411-0 Quantitative Methods II: Regression Analysis (1 Unit)**

## **LRN\_SCI 413-0 Tangible Interaction Design and Learning (1 Unit)**

This course will explore the use of tangible interaction to create innovative learning experiences. It will review both theoretical and technological foundations of the field. Topics include creative expression, embodied interaction, cultural forms, and design frameworks.

## **LRN\_SCI 415-0 Field Methods (1 Unit)**

The purpose of this course is to introduce students to the world of qualitative research so that they will be able to read qualitative studies intelligently, and learn to design and conduct qualitatively oriented studies themselves. Beginning with an overview of the epistemological assumptions behind different kinds of research, the course will explore various types of qualitative research approaches and the kinds of topics and queries they support. Students will read and critique examples of published research of various kinds. Next, students will investigate the various methods of collecting qualitative data. The class is designed so that students simultaneously read about and discuss qualitative research, and gather data themselves. Although the course touches on analysis, the main focus is on developing a qualitative research project and collecting data for it.

## **LRN\_SCI 416-0 Advanced Qualitative Methods (1 Unit)**

## **LRN\_SCI 425-0 Introduction to Design for the Learning Sciences (1 Unit)**

Building the skills and knowledge necessary to support the design of educational experiences. Exploration of general design principles and learning sciences theoretical perspectives through examination of existing cases of instructional design. A design project involving needs

analysis, specifying learning objectives, and designing a new educational experience.

## **LRN\_SCI 426-0 Design of Technological Tools for Thinking and Learning (1 Unit)**

## **LRN\_SCI 429-0 Design of Learning Environments (1 Unit)**

Issues in designing and studying innovative learning environments. New models of classroom interaction, particularly using technology to enable new cognitive and social roles for students. Topics include simulations, tutors, computer-mediated communication, project-based learning. Theoretical motivations in cognitive and social-interaction learning theories, empirical studies evaluating their effectiveness, and prospects for propagation of such innovations.

## **LRN\_SCI 434-0 Teacher Thinking & Learning (1 Unit)**

Recent research on teacher cognition, how teacher knowledge is organized and accessed, and relationship between knowledge and practices. Investigate novice and veteran teachers learning.

## **LRN\_SCI 438-0 Teaching with Technology (1 Unit)**

Conceptual strategies for integrating technology into effective pedagogy and practical strategies for employing technology in classrooms. Includes hands-on experience with technology and a design project.

## **LRN\_SCI 442-0 Social Policymaking and Policy Implementation (1 Unit)**

## **LRN\_SCI 443-0 Educational Policy: Design, Implementation and Effects (1 Unit)**

Introduction to issues in educational reform. Analyzing educational reform; framing educational policy problems; examining reformers' assumptions about the school system, about the roles of school in society, and about teaching and learning. The course is grounded in school decentralization, systemic reform and school choice.

## **LRN\_SCI 451-0 Topics in Learning Sciences (1 Unit)**

Discussion of trends in the field of Learning Sciences via articles and other resources.

## **LRN\_SCI 452-0 Constructionism Seminar (1 Unit)**

Discussion of trends in the field of Learning Sciences via articles and other resources.

## **LRN\_SCI 463-0 Topics in Research Methods (1 Unit)**

Methodological approaches to research on learning- teaching environment implementation. Methods for examining processes of change and adoption of educational interventions in various settings. May be repeated for credit with change of topic.

## **LRN\_SCI 472-0 Designing and Constructing Models With Multi-Agent Languages (1 Unit)**

Contact the department for further information.

## **LRN\_SCI 477-0 Philosophical & Historical Foundations of Education Reform (1 Unit)**

How influential root metaphors for the learner, knowledge, and learning processes become embodied in educational technologies, and how the sociocultural context of their design and use influences their appropriation or rejection.

## **LRN\_SCI 499-0 Independent Study (1-3 Units)**

SEE DEPT FOR SECTION AND PERMISSION NUMBERS.

## **LRN\_SCI 519-0 Responsible Conduct of Research Training (0 Unit)**

## **LRN\_SCI 590-0 Research (1-3 Units)**

Independent investigation of selected problems pertaining to thesis or dissertation. May be repeated for credit. - SEE DEPT FOR SECTION AND PERMISSION NUMBERS.