

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

CHILD DEVELOPMENT 127 – SCIENCE AND MATHEMATICS FOR CHILD DEVELOPMENT

3 hours lecture, 3 units

Catalog Description

Exploration of the importance and value of science and mathematics in programs for young children. Students will examine and apply theories, methods and materials to facilitate children's understanding and appreciation for the concepts of math and science with an emphasis on problem-solving skills and strategies. Includes California Preschool Foundations for Mathematics and Science and the construction and presentation of appropriate materials for young children, including children with special needs.

Prerequisite

None

Recommended Preparation

"C" grade or higher or "Pass" in CD 125 or equivalent

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Stage theory and major theories of child development as they apply to the whole child in early childhood.
- 2) Cognitive theories of child development including Jean Piaget's theories.
- 3) Observation techniques.

Course Content

- 1) Fundamental concepts, concept development, cognitive development and problem-solving skills in young children
- 2) Examination of purposes and goals for science and mathematics for young children
- 3) The role of the teacher in establishing an environment that promotes science and mathematical concepts and appreciation for young children
- 4) Rationale, materials, and methods for planning and sharing science and math experiences with young children
- 5) Compiling science and mathematical resources for working with young children, including community resources for science and math curriculum and exploration
- 6) Evaluating computer software for young children and the use of computers as a component of the early childhood environment

Course Objectives

Students will be able to:

- 1) Analyze and describe how to create an appropriate science and mathematics program and curriculum that meets the needs of young children, with special attention to gender equity, cultural factors, and individualization.
- 2) Identify and apply resources, innovative approaches, and developmental foundations for the selection and presentation of science and math materials and activities for young children.

- 3) Observe, plan, construct, and implement math and science materials and activities, based on fundamental concepts and preschool foundations, for young children to explore in an early childhood setting.
- 4) Develop and demonstrate materials and practices which encourage young children to wonder about, question, actively explore, and represent their understanding of the natural world, math and science concepts, and problem-solving strategies.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Written exams that measure students' ability to plan for, define, and apply basic math and science concepts including the California Preschool Foundations and analyze appropriate science and mathematics materials and curriculum.
- 2) Presentations that measure students' ability to identify, apply and demonstrate resources, materials and activities designed to enhance and facilitate young children's understanding and appreciation for science and math skills and concepts.
- 3) Written assignments that measure students' ability to observe, plan, and analyze appropriate activities, classroom environments and presentation strategies for groups of young children.

Special Materials Required of Student

Materials for creating teaching resources

Minimum Instructional Facilities

Smart classroom with sink, water, moveable tables, access to supplies

Method of Instruction

- 1) Lecture and discussion
- 2) Directed small group activities, discussions, and presentations
- 3) Media materials and Internet resources

Out-of-Class Assignments

- 1) Reading assignments
- 2) Written activity plans, presentation, and evaluations
- 3) Presentation of activity plans with a group of children
- 4) Preparation of materials for presentations

Texts and References

- 1) Required (representative example): Charlesworth, Rosalind and Karen Lind. *Math and Science for Young Children*. 8th edition, Cengage, 2016.
- 2) Supplemental: None

Exit Skills

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Cognitive development in young children as it applies to mathematical and scientific reasoning.
- 2) Observation of children's behavior demonstrating mathematical and scientific reasoning.
- 3) Science process skills as they apply to young children, i.e., observation, classification, prediction, communication.
- 4) Resources, techniques and materials for developmentally appropriate science curriculum that is integrated into the full curriculum.
- 5) Research, develop, write and present curriculum for a comprehensive, integrated science and math activities.

- 6) Early math concepts including classification, seriation, topology, space and number.
- 7) Resources for manipulative math and science experiences for young children.

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Analyze, apply and evaluate methods and materials that facilitate and support children's natural curiosity in math and science.
- 2) Discuss the importance and value of science and mathematics in programs for young children and apply strategies to integrate relevant content into the environment and curriculum.
- 3) Construct and present appropriate and child centered math and science experiences for young children, including children with special needs.