

**SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON**



COURSE OUTLINE

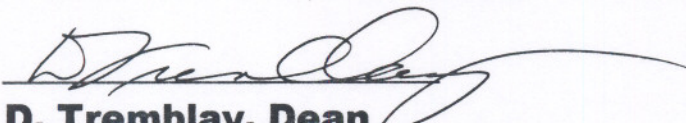
Course Title: TEACHING SCIENCE AND MATH

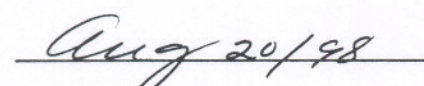
Code No.: ED 273 Semester: III

Program: EARLY CHILDHOOD EDUCATION

Author: LORNA CONNOLLY BEATTIE

Date: Sept 98 Previous Outline Date: Jan 98

**Approved: 
D. Tremblay, Dean
Health, Human Sciences and Teacher Ed.**

Date: 

Total Credits: 3 Prerequisite(s): ED 269

Length of Course: 15 wks Total Credit Hours: 45

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For additional information, please contact Donna Tremblay, Dean, School of Health, Human Sciences
and Teacher Education, (705) 759-2554, Ext. 690.



TOTAL CREDITS: 3

I. COURSE DESCRIPTION:

This is an advanced methods course dealing specifically with math and science concepts and skills with emphasis on Piagetian theory. The focus of this course is familiarizing the students with classification and discovery systems applicable in child care settings.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course the student will demonstrate the ability to:

- 1. research and translate fundamental principles of science and math into learning experiences for children.**

Potential Elements of the Performance:

- analyze Piaget's developmental stages of concept and skill development as it relates to math and science
- recognize the needs and interests of the preschool child relating to science and math
- assess children's developmental level and plan appropriate learning experiences
- examine and interpret the fundamental principles of science and math
- research and plan science and math activities based on fundamental concepts and skills
- implement science and math activities in the preschool setting

- 2. present a comprehensive, developmentally-appropriate curriculum which fosters math and science principles in young children.**

Potential Elements of the Performance:

- identify, locate and utilize available resources for a science and math program
- organize chosen science and math learning environments for pre-school children
- apply knowledge, understanding and skill in designing a sequence of science and math learning experiences
- develop a curriculum package on a science related topic

- 3. Use process-oriented and divergent teaching techniques to incorporate science and math experiences throughout the curriculum.**

Potential Elements of the Performance:

- select appropriate methods of presentation of science and math experiences using process-oriented, open-ended teaching methods.
- communicate and interact effectively with colleagues by planning and presenting a science centre and preschool science curriculum
- present math and science activities in the preschool setting
- evaluate one's teaching and the learning of the children following the presentation of math and science activities.

III. TOPICS TO BE COVERED:

1. Concept Development in Science and Math
2. Fundamental Concepts and Skills and Activities involving Math and Science
3. Scientific Investigations
4. Presenting Science Centres and Preschool Curriculum Ideas

IV. REQUIRED RESOURCES:

1. Math and Science for Young Children, 2nd Edition, Charlesworth and Lind: Delmar Publishers, 1995

V. EVALUATION PROCESS/GRADING SYSTEM:

1. Science Learning Activity – 10%

Each student will plan and present for evaluation a science activity in his/her fieldwork setting. Students should also be prepared to share their learning activity with the class. Schedule to be arranged in class.

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2. Math Activity Resource Book – 20%

Each student will prepare a "Math Activity Resource Book" to include examples that are specifically related to the following fundamental concepts. The book will be handed in during the semester for evaluation. Each activity will be described in detail using the attached form. (Example forms are also attached)

Fundamental Concepts

Due Date

One to One Correspondence;
Number & Counting;
Sets & Classifying;
Ordering & Patterning;
Shape;
Space;

October 21
(6 activities – 10%)

Parts & Whole;
Comparing;
Measurement:
Time;
Volume;
Weight;
Length;
Temperature
(Choose 4 of the 5 measurement
concepts for use in the Resource Book)

November 29
(6 activities – 10 %)

3. Math Learning Activity – 10%

Each student will choose one of the math activities prepared for the "Math Activity Resource Book" and plan and present for evaluation this activity in his/her fieldwork setting. Students should also be prepared to share their learning activity with the class. Schedule to be arranged in class.

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4. Science Centre and Preschool Curriculum Ideas - 25%

In a small group, students will research a chosen topic and then gather materials to design a science centre related to the topic. Students will refer to the list of topics attached. The centre will include visual and concrete materials, pertinent experiments and appropriate curriculum learning devices.

They will also prepare an information packet for use in the preschool setting including: title page, research material, bibliography of references and resources, centre planning chart and specific details for 2 circle ideas, 2 art ideas, 2 science activities and 2 related children's stories. These activities must be thoroughly explained with procedures, materials, recipes, etc.

These centres will be displayed in class and will be evaluated by the instructor and fellow classmates.

Students must prepare a typed 2 page "basic outline" summarizing some basic research and preschool ideas. This basic outline is to be distributed to each class member on the date of presentation of the science centre. If assistance with photocopying is required, the basic outline must be submitted to the professor one week before the date of presentation.

The complete information packet is due when the centre is presented. The dates for presentations will be arranged in class. Failure to present on the assigned date will result in a mark of zero for the presentation.

5. Midterm Test – October 21 - 15%

End of Term Test - December 18 - 20%

These tests will be based on the material presented in class and in the textbook.

COLLEGE GRADING POLICY

90 - 100% = A+
80 - 89% = A
70 - 79% = B
60 - 69% = C
BELOW 60% = R

VI. SPECIAL NOTES:

If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room #E1204, Ext. 493 so that support services can be arranged for you.

Students must complete tests on the designated date. If the student cannot attend the class for the test, the student must telephone the professor prior to the time of the test (759-2554 ext. 563) to make alternate arrangements (Refer to Testing Policy for Human Sciences and Teacher Education). If this procedure is not followed, a grade of zero will be applied for the test.

All assignments are due on the date indicated by the professor unless the appropriate number of NQAs is attached. Assignments will not be accepted more than two weeks after the due date.

Your professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

EXAMPLE

MATH ACTIVITY FORM

ACTIVITY TITLE: Matching – Dogs and People

AGE GROUP: 3 – 5

DEVELOPMENTAL STAGE: Pre-operational

FUNDAMENTAL CONCEPT: One-to-One Correspondence

OBJECTIVE: To make joined groups of three objects

MATERIALS: Two sets of three objects which normally would go together, for example, doll people holding dogs on leashes.

ACTIVITY: “Here are some people and some dogs. The dogs are on leashes. Does each person have a dog? Show me how you can tell.” Note if the children can show or explain that the leashes connect the dogs and people.

FOLLOW UP: Use other groups of objects such as cats and kittens; cups and saucers; houses and roofs; etc. Increase number of items in each group as the 3 to 3 task becomes easy.

ASSESSMENT

METHOD: Demonstration/Interview

SKILL: Child can match joined groups of 3 objects.

PROCEDURE: Present activity to child as outlined above. If the child cannot do the task, try it with 2 or 1 joined object.

EVALUATION: The child can explain or demonstrate that the leashes connect the dogs and people to demonstrate understanding of one-to-one correspondence.

MATH ACTIVITY FORM

Activity Title:
Age Group:
Developmental Stage:
Fundamental Concept:
Objective:
Materials:
Activity:
Follow-Up:
<u>ASSESSMENT</u>
Method:
Skill:
Procedure:
Evaluation:

SCIENCE CATEGORIES AND TOPICS

PHYSICAL SCIENCES:

Magnets

Simple Machines

Electricity – static and current

Light and Shadows

Gravity

Sound

Energy

States - liquid, solid, gas
- density

Matter

EARTH SCIENCES:

Rocks and Minerals

The Four Elements – Water, Air, Fire and Earth

Fossils

Dinosaurs

Weather

Outer Space

LIFE SCIENCES:

Ecosystems – food chains

Life Cycles

Plant Life - trees
flowering/non-flowering plants
seeds and germination

LIFE SCIENCES (CONTINUED) :

- Landfill Sites
- Endangered Species
- Recycling

Nutrition – Where does our Food come from

Human Body

Five/six senses

ANIMALS:

Annelids

Insects

Arachnids

Reptiles

Fish

Birds

Mammal - Non-humans

Habitat

- Ponds/Wetlands
- Ocean
- Desert
- Forest – different types
- Rivers/Lakes