

# **ECE376 Incorporating Engineering Experiences in Early Childhood Curricula**

**Level:** 3

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JULY

## **Synopsis:**

ECE376 Incorporating Engineering Experiences in Early Childhood Curricula is an elective course designed to highlight the oft-missing “E” (Engineering) in STEM/STEAM education for young children. This course will firstly introduce the notion of culturally and developmentally appropriate practices of early engineering education (EEE) anchored in contemporary theoretical and policy rationales. Based on the core idea of an engineering design process, course participants will learn how to design, implement, and evaluate young children’s engineering-related learning activities. They will also have the opportunity to learn how to identify and promote engineering learning opportunities and resources in early childhood settings, integrated into generic childcare/kindergarten curricula. All these professional knowledge and skills will be targeted at the goal of fostering young children’s STEM habits of mind (e.g., inquirers, observers, describers, encoders, decoders, and experimenters), spatial skills and computational thinking skills. Course participants will also be encouraged to think about ways to engage parents in innovative EEE. To be successful in this course, participants will need to design age-appropriate learning activities and use traditional and innovative materials to support children’s EEE with contextual appropriateness.

## **Topics:**

- The importance of early engineering education: child development and contextual considerations
- Overview of early childhood STEM learning standards
- Engineering design process: what and how
- Designing early engineering activities
- Highlighting engineering learning in classroom environment
- Identifying engineering contexts in children’s picture books
- Strategies for implementing early engineering activities
- Assessment for learning in early engineering
- Fostering “habits of mind” in young engineers
- Developing young children’s spatial skills and computational thinking skills
- Integration of engineering in a holistic curriculum
- Engaging parents in early engineering education

## **Textbooks:**

ECE376 Study Guide

ISBN-13: SG-2141

**Learning Outcome:**

- Analyse culturally and developmentally appropriate approaches to early engineering education
- Examine engineering education policies, standards and frameworks for young children.
- Discuss the possibilities of integrating engineering into an early childhood curriculum.
- Design and implement early engineering activities.
- Employ a variety of resources and strategies to support young children’s engineering thinking and design
- Use observation methods to assess children’s habits of mind, spatial skills and/or computational thinking skills

**Assessment Strategies - Regular Semester (Evening Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	PRE-CLASS QUIZ 1	5
	DISCUSSION BOARD 1	5
	TUTOR-MARKED ASSIGNMENT 1	30
Overall Examinable Components	ECA	60
<b>Total</b>		<b>100</b>

\*The information listed is subject to review and change.