Course Description

MEDD8935 Theories of Learning in STEM Education

Course description
This course provides an in-depth exploration of contemporary theories of learning, cognition, and information processing and their application to learning in STEM Education. Emphasis will be placed on understanding the implications of these theories for designing, implementing, and evaluating effective instructional practices and technologies for STEM Education. Students will engage in critical analysis of research and case studies that apply theoretical concepts to real-world STEM learning and teaching.
Course objectives
1. To provide a comprehensive understanding of the major learning and instructional theories relevant to STEM education. 2. To explore the impact and application of different learning theories on instructional design, curriculum development, and the use of educational technologies in STEM classrooms. 3. To foster the ability to apply theoretical knowledge to practical issues and problems in STEM education 4. To encourage the development of a personal theory of learning and instruction within the context of STEM education.

Course learning outcomes (CLOs)	**Aligned programme learning outcomes (PLOs)**
1. Identify and describe the key characteristics of major learning and instructional theories in relation to STEM education.	PLO 1
2. Evaluate how different learning theories inform instructional design, curriculum development, and the use of educational technologies in STEM classrooms.	PLOs 2, 3
3. Apply these theories into theoretical and practical problems in STEM education.	PLO 3
4. Develop and express a personal theory of learning and instruction in STEM education.	PLOs 1, 4

Course assessment methods
• Collaborative glossary • Weekly journal • Individual learning theory paper • Case study video and storytelling
Course content and topics
• Introduction to Learning Theories and Cognition in STEM Education • Learning and Behavior • Learning and Cognition • Learning Development and Neuroscience • Constructivism and Instruction • Learning and Stutativity • Learning and Motivation in STEM Education • Learning and Instruction: Toward a Personal Theory for STEM Education
Required / recommended readings and online materials
Driscoll M & Burner, K. (2022). *Psychology of Learning for Instruction*, 4th edition, Pearson.
Other additional course information
Nil