

Instrumentation System in Civil Engineering (CIEE 728 / IMSC029)

Semester Syllabus

Part 1: Course Information

Instructor Information

Instructor: Dr. Lam Chi Chiu

E-mail: fstccl@umac.mo

Course Description

This course is designed to introduce the concept and application of instrumentation system in Civil Engineering. The following topics will be discussed in the class: (1) Instrumentation systems, Signals and Errors, (2) Characteristics of instruments – Transducers, Noise and Nonlinearity, Static characteristics, Dynamic characteristics, (3) Signal conditioning – Introduction, Operating amplifier, Applications of Op-amps, filtering, (4) Data acquisition – Analog devices, Digital Devices, Sampling Theorem, Nyquist frequency, Quantization error, (5) Noise Reduction – Interference, Shielding, Grounding, Noise mode, Noise elimination or reduction, (6) Instruments and Sensors – Strain gauge, LVDT, Pressure transducer, Load cell (7) Signal Processing – Sampling Theorem, Laplace-transform and Z-transform. Students are expected to obtain knowledge about the background theory and application of different type of instruments used in Civil Engineering.

Prerequisite

None

Course Duration

42 contact hours, 3 hours per week (3-credit course)

Credit: 3

Compulsory/elective course: Elective

Part 2: Course Objectives

1. Introduce students to the concept and application of instrumentation system in Civil Engineering.
2. Introduce students to understand the background theory and application of different type of instruments used in Civil Engineering.

Part 3: Major Assessment Methods

Homework:	25%
Mid-term exam:	35%
Final exam:	40%