HUMBER

Course Outline

Course Name: Process Instruments (TECH 157)

Academic Period: 2022 - 2023

Faculty:

Faculty Availability:

Associate Dean:
Shaun Ghafari
shaun.ghafari@humber.ca

Schedule Type Code:

Land Acknowledgement

Humber College is located within the traditional and treaty lands of the Mississaugas of the Credit. Known as Adoobiigok [A-doe-bee-goke], the "Place of the Alders" in Michi Saagiig [Mi-Chee Saw-Geeg] language, the region is uniquely situated along Humber River Watershed, which historically provided an integral connection for Anishinaabe [Ah-nish-nah-bay], Haudenosaunee [Hoeden-no-shownee], and Wendat [Wine-Dot] peoples between the Ontario Lakeshore and the Lake Simcoe/Georgian Bay regions. Now home to people of numerous nations, Adoobiigok continues to provide a vital source of interconnection for all.

Equity, Diversity and Inclusion Statement

Humber College and the University of Guelph-Humber (Humber) are leaders in providing a learning, working and living environment that recognizes and values equity, diversity and inclusion in all its programs and services. Humber commits to reflect the diversity of the communities the College serves. Students, faculty, support and administrative staff feel a sense of belonging and have opportunities to be their authentic selves.

Faculty or Department	Faculty of Applied Sciences & Technology
Course Name:	Process Instruments (TECH 157)
Pre-Requisites	none
Co-Requisites	none
Equates	none
Restrictions	none
Credit Value	3
Total Course Hours	56

Developed By:	Prepared By:	Approved by:
		Shaun Ghafari

Humber Learning Outcomes (HLOs) in this course.

The HLOs are a cross-institutional learning outcomes strategy aimed at equipping Humber graduates with the employability skills, mindsets, and values they need to succeed in the future of work. To explore all the HLOs, please consult the Humber Learning Outcomes framework.

Course Description

N/A

Course Rationale

Learning of the principles and concepts of instrumentation is essential aspect of education of electrical technicians and technologists. As a part of their duties, they must not only install and maintain the instrumentation components but also be able to apply their knowledge in design of control systems.

Course Learning Method(s)

- Case Based Learning
- Lecture

Learning Outcomes

- Define terms used in the automated process industry
- Draw open and closed loops using the appropriate ISA symbols
- Apply the techniques of calibration using field standards to specification
- Calculate absolute and relative error of process variable
- Perform pressure measurements using proper techniques
- Apply various instrumentation for level and liquid density measurements
- Apply instrumentation for temperature measurement
- Apply instrumentation for flow measurement

Assessment Weighting

Assessment	**Weight**
Final Exam	
Test#3	24%
In-class Exercise	
Lab assignment	30%
Midterm Exam	
Test#1	23%
Test#2	23%
Total	**100%**

Modules of Study

Module	Course Learning Outcomes	Resources	Assessments
Module 1: Introduction to Instrumentation	• Define terms used in the automated process industry • Draw open and closed loops using the appropriate ISA symbols	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Test#1 • Lab assignment
Module 2: Transmission Signals, Measurement and Transmission Relationships	• Apply the techniques of calibration using field standards to specification • Calculate absolute and relative error of process variable	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Test#1 • Lab assignment
Module 3: Pressure Measurement	• Perform pressure measurements using proper techniques	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Test#1 • Lab assignment
Module 4: Level Measurement	• Apply various instrumentation for level and liquid density measurements	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Lab assignment • Test#2
Module 5: Liquid Density Analyzers	• Apply various instrumentation for level and liquid density measurements	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Lab assignment • Test#2
Module 6: Temperature Measurement Using Thermal Expansion Thermometers	• Apply instrumentation for temperature measurement	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Lab assignment • Test#3

Module	Course Learning Outcomes	Resources	Assessments
Module 7: Flow Measurement	• Apply instrumentation for flow measurement	Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.	• Lab assignment • Test#3

Required Resources

Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.

Supplemental Resources

Weedon, T.A., Kirk, Ph., Kirk, F.W. (2019). *Instrumentation and Process Control Workbook (7th Ed.)*. Orland Park, Illinois: American Technical Publishers.

Additional Tools and Equipment

- Not required

Essential Skills

Section	Skills	Measurement	Details
Communication	• Reading • Writing • Speaking • Presenting • Visual Literacy	Teach and measure	• Through lecturing and practical activities in the laboratory • Through lab assignments and tests
Numeracy	• Understanding and applying mathematical concepts and reasoning • Analyzing and using numerical data	Teach and measure	• Through lecturing, lab activities, discussions, case studies • Through lab assignments and tests
Critical Thinking and Problem-Solving	• Analysing • Evaluating • Decision-Making	Teach and measure	• Through lecturing, lab activities, discussions • Through lab assignments and tests
Information Management	• Gathering and managing information • Selecting and using appropriate tools and technology for a task or project • Computer literacy	Teach and measure	• Through lecturing and lab activities • Through lab assignments and tests

Section	Skills	Measurement	Details
Interpersonal Skills	• Teamwork • Conflict resolution	Reinforce and measure	• Through lab activities • Through lab assignments
Personal Skills	• Managing self • Managing change and being flexible and adaptable • Engaging in reflective practice • Demonstrating personal responsibility	Reinforce and measure	• Through lab activities • Through lab assignments

Prior Learning Assessment & Recognition (PLAR)

Prior Learning Assessment and Recognition (PLAR) is the formal evaluation and credit-granting process whereby candidates may obtain credits for prior learning. Prior learning includes the knowledge competencies and skills acquired, in both formal and informal ways, outside of post-secondary education. Candidates may have their knowledge, skills and competencies evaluated against the learning outcomes as defined in the course outline. Please review the Assessment Methods Glossary for more information on the Learning Portfolio assessment methods identified below.

The method(s) that are used to assess prior learning for this course may include:

- Challenge Exam (results recorded as a % grade and added to student's CGPA)
- Learning Portfolio (results reflected as SAT and not added to student's CGPA)
- Skills Test
- Interview

Please contact the Program Coordinator for more details.

Academic Regulations

It is the student's responsibility to be aware of the College Academic Regulations. The Academic Regulations apply to all applicants to Humber and all current students enrolled in any program or course offered by Humber, in any location. Information about academic appeals is found in the **Academic Regulations**.

Anti-Discrimination Statement

At Humber College, all forms of discrimination and harassment are prohibited. Students and employees have the right to study, live and work in an environment that is free from discrimination and harassment. If you need assistance on concerns related to discrimination and harassment, please contact the Centre for Human Rights, Equity and Inclusion or the Office of Student Conduct.

Accessible Learning Services

Humber strives to create a welcoming environment for all students where equity, diversity and inclusion are paramount. Accessible Learning Services facilitates equal access for students with disabilities by coordinating academic accommodations and services. Staff in Accessible Learning Services are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. If you require academic accommodations, contact:

Accessible Learning Services

North Campus: (416) 675-6622 X5090

Lakeshore Campus: (416) 675-6622 X3331

Academic Integrity

Academic integrity is essentially honesty in all academic endeavors. Academic integrity requires that students avoid all forms of academic misconduct or dishonesty, including plagiarism, cheating on tests or exams or any misrepresentation of academic accomplishment.

Disclaimer

While every effort is made by the professor/faculty to cover all material listed in the outline, the order, content, and/or evaluation may change in the event of special circumstances (e.g. time constraints due to inclement weather, sickness, college closure, technology/equipment problems or changes, etc.). In any such case, students will be given appropriate notification in writing, with approval from the Dean (or designate) of the School.

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