Yukon Water & Wastewater Operator Program

SCADA and Control Systems in Yukon - Introduction

Course Outline

INSTRUCTOR: Alison Anderson
DATE: February 21 – 22, 2018 (Wednesday – Thursday)
TIME: 8:00 am – 3:30 pm

Course Description

This 2 day (12 hour) course is designed to introduce participants to process control, control system components and their purposes within a control system, as well as methods for troubleshooting operational issues. The focus is on systems typically used in small Water Treatment Plants (WTPs) and Wastewater Treatment Plants (WWTPs) in Yukon. This course provides practical skills that can assist with control systems troubleshooting and upgrading/design.

Course Pre-requisites

There are no specific pre-requisites for this course. However, Grade 12 (or equivalent) math skills are an asset. Math upgrades are available –contact us.

Continuing Education Units (CEUs)

This course is recognized by EOCP for 1.2 CEUs (core for SWS, WT, WD, WWT, WWC and SWWS certifications).

Course Duration

- 2 days
- 8:00 am to 3:30 pm each day
- 1 hour lunch break
- morning and afternoon break (15 minutes each)

Course Topics and Learning Outcomes

Upon successful completion of the course, the students will be able to:

1. Interpret a control narrative for a typical Yukon WTP/WWTP
2. Differentiate between the different components of a control system (e.g. PLC, instruments, HMI, SCADA) within a typical Yukon WTP/WWTP
3. Explain the purpose of the different components within a typical Yukon WTP/WWTP control system
4. Describe the control system troubleshooting steps appropriate for use in a typical Yukon WTP/WWTP
5. Identify the appropriate steps to use for given operational issues within a typical Yukon WTP/WTPP
6. Recommend appropriate solutions to operational issues within a typical Yukon WTP/WTPP
7. Contribute to the design/upgrading of control systems within Yukon WTPs/WTPPs

Delivery Method/Format

Instructional Method	Percentage of Class Time
Brainstorming/Q & A	20%
Examples/Case Study	20%
Presentation/Lecture/Slides	50%
Demonstration	10%

Material/Handouts (supplied)

- Student Binder: Yukon College, 2018. SCADA and Control Systems in Yukon - Introduction; an Elective –Technical Development– course. Whitehorse, Yukon.
- EOCP Course Completion and Evaluation Form.
  - every student needs to complete and return this form for any CEU allocation
- Calculators are provided but students are welcome to use their own.
  - please return

Course Requirements

Attendance and participation in class are required. CEUs will be allocated based on attendance and course completion; Yukon College records will show a pass or fail result. If the participant doesn't attend the class, Yukon College records will show a "no show" result and no CEUs will be allocated.

Evaluation

There will be a quantifiable evaluation at the end of this course with a passing mark of 70%. Please note that this evaluation is for self-assessment purpose only.

Appropriate Language

In all areas of the college environment, students are responsible for showing respect for others. Swearing, or language that is discriminatory or derogatory in relation to race, sex, ethnic background, religious beliefs, age, and physical condition is not appropriate.

Computer classes can be particularly frustrating for students; therefore, students are encouraged to manage their stress in such a way that it does not disturb others. There may be times it is best for the student to step out of the classroom to manage stress and minimize the disruption of others in the class.

Electronic Devices

In order to be successful in classes and minimize distractions for others, cell phones, iPods, and other electronic devices must be turned off while students are in class. In an emergency situation, the instructor may give a student permission to use a cell phone or pager.

Academic and Student Conduct

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/Admissions & Registrations web page.

Plagiarism

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style

(e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

Academic Accommodation

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

Class Outline

Day 1

Topic	Time Allocation
Introductions/Housekeeping	30 mins
Process Drawings and Process Types	60 mins
Break	15 mins
Instrumentation	30 mins
PLC and Ladder Logic	75 mins
Lunch	60 mins
HMI and SCADA Interfaces	60 mins
Holistic Control System	60 mins
Break	15 mins
Recap and things to consider (homework)	45 mins

Day 2

Topic	Time Allocation
Recap Day 1	30 mins
Common Issues and Troubleshooting Steps	60 mins
Break	15 mins
Troubleshooting Process	60 mins
Finding Root Causes and Recommending Solutions	45 mins
Lunch	60 mins
Maintenance	90 mins
Break	15 mins
Contributing to Design	75 mins