

LANEY COLLEGE  
Environmental Control Technology  
Spring Semester 2015  
**ECT 35**

Course: CONTROL SYSTEMS INTEGRATION  
Course Number: ECT 35  
Course Codes: 24917 (Lecture), 24918 (Lab)  
Lecture: Tuesdays 5:30 to 6:45  
Lab: Thursdays 5:30 to 6:45  
Instructor: John Clark  
Location: B123  
Office Hour: Tuesday 5:00 to 5:30  
Phone: (510) 531-6107  
Email: [jclark@peralta.edu](mailto:jclark@peralta.edu)  
Class Website: [www.laney.edu/wp/jclark](http://www.laney.edu/wp/jclark)  
Units: 2

Course Description: Introduction to control system integration practices: Common open protocols such as BACnet, Modbus and LonWorks. Use of integration platforms such as Tridium Niagara, FieldBus device translators, and wireless protocol integration. Review of whole building systems integration strategies.

Student Outcomes:

1. Demonstrate understanding of control concepts and network data communications.
2. Demonstrate understanding of LonWorks protocol, network architecture, programming and troubleshooting.
3. Demonstrate understanding of BACnet protocol, network architecture, programming and troubleshooting.
4. Become familiar with typical system integration scenarios and understand the differences in implementation between LonWorks and BACnet.

Prerequisites: ECT 27

Text: Building Automation: System Integration with Open Protocols, ATP Publishing, Item 2012  
ATP Publishing website: [www.atplearning.com](http://www.atplearning.com)

Supplies Needed: Safety glasses, small and medium flat blade and philips screwdrivers, combination wire cutter, stripper and crimper, one roll of electrical tape, wire connectors, multi-meter, pocket thermometer and tool box or pouch.

Topics:

➤ **Building Automation**

- Building Automation Interoperability
- Control Concepts
- Data Communications

- **LonWorks Technology**
  - LonWorks System Overview
  - Network Architecture and Infrastructure
  - LonWorks Nodes
  - Network Programming
  - Network Maintenance
- **BACnet Systems**
  - BACnet System Overview
  - Transports and Internetworking
  - Basic Objects and Core Services
  - Alarming, Scheduling and Trending
  - Installation, Configuration, and Trending
- **Building System Integration**
  - System Integration
  - Cross-Platform Integration
  - Future Trends in Building Automation

Over the course of semester students will complete extensive series of Lab projects based on Tridium Niagara AX framework in a real life environment using Tridium JACE controllers and interfacing equipment in DDC controls lab.

Evaluation: The following classroom work and projects will be evaluated as follows.

1.	Attendance	5%
2.	Tests	25%
3.	Quizzes	15%
4.	Lab Assignments s	5%
5.	Homework Assignments	20%
6.	Final Exam	30%

**Grading:**

- 91% -100% A
- 81% - 90% B
- 71% - 80% C
- 60% - 70% D
- 50% - 60% F

Attendance: Students may be dropped from the course if the number of absences exceeds two days' worth of class meetings. **It is student's responsibility to drop classes.**

Note: During class no cell phones, eating, drinking or talking allowed. There will be one ten minute break. Students are required to wear safety glasses in the lab work area.