

Basic Course Information

Semester:	Spring 2021	Instructor Name:	Jose L Castillo Jr
Course Title & #:	APTL 105 Telecommunications Technician V	Email:	jlcastillo@iid.com
CRN #:	21722	Webpage (optional):	Imperial.edu
Classroom:	J15 Bldg IID HQ	Office #:	760-427-8428
Class Dates:	Feb 16 – Jun 11 2021	Office Hours:	0600-1600
Class Days:	Tuesdays	Office Phone #:	760-427-8428
Class Times:	1600-2015	Emergency Contact:	Daniel Diaz
Units:	4	Class Format:	

Course Description

Instruction in installation, configuration, testing, maintaining, troubleshooting and repairing the District's SCADA, data-communication, revenue meter, and associated power plant systems. (Nontransferable, nondegree applicable) (Nontransferable, AA/AS degree only)

Course Prerequisite(s) and/or Corequisite(s)

Successful completion of Electrical Trade IV with a "C" or better.

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. recognize communication circuit types & speeds. (ILO2, ILO3)
2. understand supervisory control and data acquisition (SCADA). (ILO2, ILO3)
3. understand SCADA substation automation. (ILO2, ILO3)

understand modern protocol, human machine interface, and configuration/networking. (ILO2, ILO3)

Course Objectives

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

1. A. Recognize communication circuit types & speeds
2. Recognize Baud Rate/T-Carrier (Fractional TI, TI, T3)
3. Identify digital signals, Optical carriers and Ethernet
4. Recognize RS-232, RS-422 & RS-485
5. B. Understand supervisory control and data acquisition (SCADA)
6. Learn the origin of supervisory control and data acquisition Real-time substation data application.
7. Understand RTU/Legacy RTU Protocol
8. Understand DNP3 Protocol
9. Understand Test Equipment and diagnostic tools
10. C. Understand SCADA substation automation - networking and data collection
11. Learn about the new generation of SCADA, data concentrators, smart RTU, substation computing platforms
12. Understand intelligent electronic devices

13. Learn about the modern protocol (DNP, Modbus, TCP/IP, IEC 61850) & data collection
14. Understand human machine interface

Understand configuration/networking

Textbooks & Other Resources or Links

- Kirk, Franklyn W., Weedon, Thomas A., and Kirk, Philip 2011. *Instrumentation* 5th. Homewood, Illinois. American Technical Publishers, Inc ISBN: 978-0826934307.
- Stuart A. Boyer 2009. *SCADA-Supervisory Control and Data Acquisition* 4th. ISA ISBN: 9781936007097.
- Jan Axelson 2007. *Serial Port Complete* 2nd. Lakeview Research ISBN: 9781931448062.
- Gordon Clarke CP Eng BEng MBA and Deon Reynders Pr Eng BSc MBA 2004. *Practical Modern SCADA Protocols* 1st. Newnes ISBN: 9780750657990.
- Joseph A. Pecar and David A. Garbin *Telecom Factbook* 3rd.

Course Requirements and Instructional Methods

METHOD OF EVALUATION TO DETERMINE IF OBJECTIVES HAVE BEEN MET BY STUDENTS:	
Essay	
Mid-Term/Final Exam(s)	
Objective	
Oral Assignments	
Problem Solving Exercise	
Quizzes	
Skill Demonstration	
Written Assignments	
Class Activity	
VII. INSTRUCTIONAL METHODOLOGY:	
Audio Visual	
Computer Assisted Instruction	
Demonstration	
Discussion	
Group Activity	
Individual Assistance	
Lab Activity	

Lecture
Simulation/Case Study

Course Grading Based on Course Objectives

90-100% = A
 80-89% = B
 70-79% = C
 60-69% = D
 Below 60% = F

There are 5 quizzes (10 pts. each) 50 total pts.
 Homework Assignments-50 total pts
 3 Lab Exercises 25 total pts.
 1 mid-term (50 pts.)
 1 final exam. (100 pts.)

Total of 275 pts. Total accumulated points are divided by 275 to arrive at percentage score.

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the IID policy and procedures 4530 for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c)

communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, only students enrolled in the class may attend; children are not allowed.

Online Etiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].
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Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC [General Catalog](#).



IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visitor click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

Date or Week	Activity, Assignment, and/or Topic	Pages/ Due Dates/Tests
Week 1 Feb 16 - 19	Syllabus & Introduction Terms and Definitions	
Week 2 Feb 22 - 26	Quiz on Terms and Definitions Communications Cables and specifications	Quiz #1-Define terms
Week 3 Mar 1 - 5	Communications Cables and specifications Lab-Making and testing various communications cables	
Week 4 Mar 8 - 12	Quiz on cable specifications, demonstrate and test cables	Quiz #2-Make connectors, cables and verify with testing
Week 5 Mar 15 - 19	Communication circuit types and different speeds DS0, T1, Baud rates, 2 wire, 4 wire, 568A/B, DS3, Fractional T1 C37.94, FXO/FXS, Ethernet, RS-232.	
Week 6 Mar 22 - 26	Communication circuit types and different speeds DS0, T1, Baud rates, 2 wire, 4 wire, 568A/B, DS3, Fractional T1 C37.94, FXO/FXS, Ethernet, RS-232.	Quiz #3-Communications Circuit Types and speeds
Week 7 Mar 29 - Apr 2	Review for Midterm Weeks 1-7	
Spring Break Apr 5 - Apr 9	No School	
Week 8 Apr 12 - 16	Mid Term Exam Lab Exam-Make and test communications cables and connector	
Week 9 Apr 19 - 23	Optical Carriers and Fiber specifications Lab-Optical test equipment	
Week 10 Apr 26 - 30	Optical Carriers and Fiber specifications Understanding SCADA network	Quiz #4-Optical/Fiber
Week 11 May 3 - 7	Understanding SCADA network Various protocols: DNP3, Modbus	
Week 12 May 10 -14	Diagnostics and Testing protocols	Quiz #5-SCADA networks
Week 13 May 17 - 21	Diagnostics and Testing protocols Lab exercise-Using Test equipment	
Week 14 May 24 - 28	Intelligent Electronic Devices Human Machine Interface	
Week 15 Jun 1 - 4	Review for Final Exam Weeks 9-15	
Week 16 Jun 7 - 11	Final Exam	

Subject to change without prior notice

