

**COURSE SYLLABUS**

**ENER 2325 (3:2:4)**

**SCADA and Networking**

**Industrial Manufacturing and Emerging Technologies**

**Industrial Technology Department**

**Technical Education Division**

**Levelland, Reese and Plainview Campus**

**SOUTH PLAINS COLLEGE**

**Fall 2023**

COURSE SYLLABUS

COURSE TITLE: SCADA and Networking

INSTRUCTOR: Raymund Elizondo  
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OFFICE LOCATION: ET Building, Reese Center, and Plainview Room # IM103, IM104, RC215C, PTB112

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OFFICE HOURS: By appointment

## SOUTH PLAINS COLLEGE IMPROVES EACH STUDENTS LIFE

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### I. GENERAL COURSE INFORMATION:

- A. **Course Description:** Topics in Supervisory Control and Data Acquisition (SCADA) systems, Industrial Ethernet communications systems as they apply to industry.
- B. **End-of-Course Outcomes:** Define SCADA nomenclature; demonstrate knowledge of the basic technology of each of SCADA's major building blocks; select the appropriate SCADA technologies for your operational requirements; configure the successful application of IEEE 802.3 standards, determine cabling, fiber optics, connectors, and hardware that meet industry needs; create documentation related to SCADA and Network Equipment.
- C. **Course Competencies:** Students must demonstrate the ability to master the concepts and techniques covered in the classroom and lab. Each student must attain a minimum level of 70% as an average on written tests, both daily and final.
- D. **Tutoring:** Students who do not pass their first exam will be required to attend three hours of tutoring each week until they pass their exam. This is a course requirement and will be reflected in the course grade.
- E. **Academic Integrity:** It is the aim of the Industrial Manufacturing and Emerging Technologies faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own work which he or she not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension. Students should refer to the SPC General Catalog policy regarding consequences for cheating and plagiarism ( see "Academic Integrity" as well as "Student Conduct" sections in the college catalog). At times, working with other students is encouraged for some assignments and meets SCANS competencies C-9 through C-14. If you have a question as to whether you may work with other students on any assignment, ASK YOUR INSTRUCTOR.
- F. **SCANS and Foundation Skills:** The appropriate Competencies and Foundation Skills (SCANS) have been integrated into the IMET program. The following Competencies and Foundation Skills have been specifically integrated into the Course. C2, C15, and F7

### II. SPECIFIC COURSE/INSTRUCTOR REQUIREMENTS:

- A. **Textbook and Other Materials:** No Textbook Required.
- B. **Tools:** TI-30Xa Scientific Calculator, ANSI approved Safety Glasses, Pocket knife (Lock Blade) Or Multi-Tool, Digital Multi-meter, USB Jump-drive (Memory Stick), Earphones with standard audio jack for listening to computer audio files with, Ear Plugs or some type of hearing protection, and a class G Hard hat and a Windows based laptop or desktop computer with internet access for online assignments and meetings.

### C. **Covid Procedures**

If you are experiencing any of the following symptoms, please do not attend class and either seek medical attention or get tested for COVID-19.

- Cough, shortness of breath, difficulty breathing
- Fever or chills
- Muscles or body aches
- Vomiting or diarrhea
- New loss of taste and smell

Please also notify DeEtte Edens, BSN, RN, Associate Director of Health & Wellness, at dedens@southplainscollege.edu or 806-716-2376.

1. SPC will follow the recommended 5-day isolation period for individuals that test positive.
  - a. **Please note that day 0 is the date of positive test. Day 1 begins the first full day after the date of positive result.**
2. COVID reporting
  - a. Please have students and employees notify DeEtte Edens if they have tested positive to verify dates before returning to class or work.
  - b. The home tests are sufficient but students need to submit a photo of the positive result. The date of test must be written on the test result and an ID included in the photo. If tested elsewhere (clinic, pharmacy, etc.), please submit a copy of the doctor's note or email notification. Results may be emailed to DeEtte Edens, BSN, RN at dedens@southplainscollege.edu.
  - c. A student is clear to return to class without further assessment if they have completed:  
The 5-day isolation period, symptoms have improved and they are afebrile for 24 hours without the use of fever-reducing medication.
3. Students and employees are required to communicate with DeEtte Edens ( dedens@southplainscollege.edu ) prior to their return date if still symptomatic at the end of the 5-day isolation.
4. Exposed individuals will not be required to quarantine. If exposed, SPC does request individuals closely monitor themselves. If an individual does become symptomatic, please do not attend class or work and be tested.

### D. **South Plains College Attendance Policy**

Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become excessive as defined in the course syllabus.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date, as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or "F" as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student's responsibility to be aware of that policy.

It is the student's responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.

### **Absence for Military Service**

In accordance with Texas Education Code Section 51.9111, a student is excused from attending classes or engaging in other required activities, including exams, if he or she is called to active military service of a reasonably brief duration. The maximum time for which the student may be excused has been defined by the Texas Higher Education Coordinating Board as “no more than 25 percent of the total number of class meetings or the contact hour equivalent (not including the final examination period) for the specific course or courses in which the student is currently enrolled at the beginning of the period of active military service.” The student will be allowed a reasonable time after the absence to complete assignments and take exams.

### **Religious Holy Days**

In accordance with Texas Education Code Section 51.911, South Plains College will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within seven (7) calendar days after the absence. Students are required to file a written notification of absence with each instructor within the first fifteen (15) days of the semester in which the absence will occur. Forms for this purpose are available in the Dean of Students Office along with instructions and procedures. “Religious holy days” means a holy day observed by a religion whose place of worship is exempt from property taxation under Texas Tax Code Section 11.20.

- E. The following attendance guidelines have been established for the IMET program:
1. **Absent** from class is defined as “not present and ready to participate during scheduled lecture or lab times.”
  2. **Tardy** is defined as “not present at the designated starting time of the lecture or lab.” **Three tardy will equal one absence and will be treated the same as any absence.**
  3. When a student accumulates **six** absences minimum course objectives cannot be met. At the discretion of the instructor, the student may be withdrawn from the course.
- F. **Assignment policy:** All required work must be turned in on time in order that the student may benefit from the corrections and study for future examinations. Any work that is handed in post the due date or tests missed will be accepted only at the discretion of the Instructor, Points will be taken from all late assignments or test accepted by the Instructor.
- G. **Grading Policy:** Daily tests average will equal 33.3% of final semester grade lab grade will equal 33.3% of final semester grade and final test grade will equal 33.3% of final semester grade. Written and oral assignments will be averaged in with daily test average and lab grade will consist of lab projects. The lab grade will also include an end of semester Instructor assessment that will be used to adjust the lab grade up or down by up to 20%. This is used to account for class participation, safety violations, end of class clean up as well as other criteria deemed important by the instructor such as overall attitude and demeanor.
- H. **Special Requirements:** Students in the Industrial Manufacturing and Emerging Technologies program will be required to follow safety procedures while in the classroom and lab. Chemical hazards and appropriate SDS safety practices will be stressed as part of the safety program.
- I. **Cell phones**  
No cell phones or other electronic devices are allowed in the classroom or during lectures.  
Cell phones may be used during break or during labs.
- J. **Class Dress Code**  
No open toed shoes, sandals or flip-flop styled shoes.  
No baggy, saggy or drooping clothes. This includes wearing pants pulled down in a “Low Slung Style”.  
For safety considerations standard shop acceptable attire is required.  
If you have any doubts about what is acceptable see the instructor for clarification.
- K. **Tobacco Use**  
No tobacco use of any kind is permitted inside the buildings.  
This includes smokeless tobacco.  
No spitting in the trashcans  
No spitting in the urinals or toilets  
No spitting on the floor (Including inside the lab/Shop areas)  
No use of cups or bottles as spittoons.

## **III. COURSE OUTLINE**

- Networking Basics
- Network Addressing
- Network Cables
- HMI Basics
- HMI- PLC Interfacing and communications
- HMI WEB Page setup
- Data Acquisition
- Alarms Logging
- HMI E-mail setup

**Students can find statements for:**

Intellectual Exchange, Disabilities, Non-Discrimination, Title IX Pregnancy Accommodations, CARE (Campus Assessment, Response, and Evaluation) Team, and Campus Concealed Carry at

<https://www.southplainscollege.edu/syllabusstatements/>

SCANS COMPETENCIES
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**RESOURCES: Identifies, organizes, plans and allocates resources.**

- C-1 **TIME**--Selects goal--relevant activities, ranks them, allocates time, and prepares and follows schedules.
- C-2 **MONEY**--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- C-3 **MATERIALS & FACILITIES**-Acquires, stores, allocates, and uses materials or space efficiently.
- C-4 **HUMAN RESOURCES**--Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

**INFORMATION--Acquires and Uses Information**

- C-5 Acquires and evaluates information.
- C-6 Organizes and maintains information.
- C-7 Interprets and communicates information.
- C-8 Uses computers to Process information.

**INTERPERSONAL--Works With Others**

- C-9 Participates as members of a team and contributes to group effort.
- C-10 Teaches others new skills.
- C-11 Serves clients/customers--works to satisfy customer's expectations.
- C-12 Exercises leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- C-13 Negotiates-Works toward agreements involving exchanges of resources resolves divergent interests.
- C-14 Works with Diversity-Works well with men and women from diverse backgrounds.

**SYSTEMS--Understands Complex Interrelationships**

- C-15 Understands Systems--Knows how social, organizational, and technological systems work and operates effectively with them
- C-16 Monitors and Correct Performance-Distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions.
- C-17 Improves or Designs Systems-Suggests modifications to existing systems and develops new or alternative systems to improve performance.

**TECHNOLOGY--Works with a variety of technologies**

- C-18 Selects Technology--Chooses procedures, tools, or equipment including computers and related technologies.
- C-19 Applies Technology to Task-Understands overall intent and proper procedures for setup and operation of equipment.
- C-20 Maintains and Troubleshoots Equipment-Prevents, identifies, or solves problems with equipment, including computers and other technologies.

FOUNDATION SKILLS
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**BASIC SKILLS--Reads, writes, performs arithmetic and mathematical operations, listens and speaks**

- F-1 Reading--locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- F-2 Writing-Communicates thoughts, ideas, information and messages in writing, and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
- F-3 Arithmetic--Performs basic computations; uses basic numerical concepts such as whole numbers, etc.
- F-4 Mathematics--Approaches practical problems by choosing appropriately from a variety of mathematical techniques.

F-5 Listening--Receives, attends to, interprets, and responds to verbal messages and other cues.

F-6 Speaking--Organizes ideas and communicates orally.

**THINKING SKILLS--Thinks creatively, makes decisions, solves problems, visualizes, and knows how to learn and reason**

F-7 Creative Thinking--Generates new ideas.

F-8 Decision-Making--Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

F-9 Problem Solving--Recognizes problems and devises and implements plan of action.

F-10 Seeing Things in the Mind's Eye--Organizes and processes symbols, pictures, graphs, objects, and other information.

F-11 Knowing How to Learn--Uses efficient learning techniques to acquire and apply new knowledge and skills.

F-12 Reasoning--Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

**PERSONAL QUALITIES--Displays responsibility, self-esteem, sociability, self-management, integrity and honesty**

F-13 Responsibility--Exerts a high level of effort and preservers towards goal attainment.

F-14 Self-Esteem--Believes in own self-worth and maintains a positive view of self.

F-15 Sociability--Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

F-16 Self-Management--Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

F-17 Integrity/Honesty--Chooses ethical courses of action.