

Oklahoma State University Institute of Technology
Course Syllabus
Fall 2017

ETDE-3223 Industrial Network

Students learn fundamentals of local area networks and their operation in the industrial control environment. Topics will include the characteristics of network topologies, system hardware (repeaters, bridges, switches and gateways), system configuration and installation and administration of the LAN. Upon completion, students can install, maintain, and manage typical industrial control networks.

Course Purpose:

The purpose of this course to introduce students with different industrial network protocols by applying these protocols to connect and transfer data between different industrial systems.

Type of course: Theory/Lab.

Credit Hours: 3;

Total hours of theory per semester: 30;

Total hours of lab for the semester: 45;

Class length - Full Semester

Class days and times: TTR 08:00- 10:25 PM

Prerequisites: ETDE 2123, ETDE 2273

Instructor Name: Asif Hoque

Instructor Phone: (918) 293-5375

Office: ETDE Building -Room 15J

Instructor email: asif.hoque@okstate.edu

Instructor's Office Hours: Monday, Wednesday, Friday: 3.00 pm to 4.00 pm

Tuesday, Thursday: 10.30 pm to 11.30 pm

Division Name: Engineering Technologies

Division Phone: (918) 293-5150

REQUIRED TEXT, REFERENCES, AND MATERIALS

Texts: Fieldbus and Networking in Process Automation, Sunit Kumar Sen, ISBN-13:978-1-4667-8676-5

References: Handouts + Notes

Materials: Basic class materials, calculator, jump drive

Uniform/Tools: Digital Multi-meter, ETDE toolkit or equivalent

Estimated Cost for Materials: \$100

Estimated Cost for Uniform/Tools: NA

Optional Resources: Windows 10 OS Laptop Computer with the following minimum requirements: 8GB RAM (16GB preferred), 1TB Hard drive, Intel i5 CPU (i7 preferred), dedicated graphics card, 1600x900 screen resolution or better, Wi-Fi connectivity, DVD player. (Apple Mac computers are highly discouraged due to software compatibility issues)

Upon completion of this course, students should demonstrate the ability to:

Course Outcomes	Assessment Method
1. Utilize PLCs and SCADA for control of manufacturing and process control systems	Labs/presentations
2. Implement/analyze different protocols to acquire data and control different constituents of a process control systems.	Labs/exams/Reports/presentation
3. Apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology dealing with modern data communications, protocols and standards.	Labs/ Exams/Reports
4. Implement different network technologies involved from the control of the process to the management of data.	Labs/Reports/Exam

COURSE ACTIVITIES

In this course students will:

- *Participate in class discussions and activities.*
- *View videos that depict the various concepts.*
- *Contribute to a course Service Learning project.*
- *Participate in group and individual presentations.*
- *Compile a portfolio of work produced.*
- *Take examinations.*
- *Complete reading assignments.*
- *May be required to do quizzes.*

EVALUATION - GRADES WILL BE BASED ON THE QUALITY AND COMPLETION OF THESE TASKS:

The final course grade will be calculated with the following weights:

2 Unit Exams.....	25%
Final*	20%
Lab.....	30%
Report.....	15%
Presentation.....	10%
Total	100%

OSUIT Grading Scale
A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% & below

*The student's grade for this assignment will be used in the university's assessment of student learning. A 70% competency or higher receives a Pass rating. This Pass/Fail rating is independent of the student's course grade.

Daily and/or weekly quizzes, small weekly assignments and similar type projects: Normal return time to student by next class meeting or no later than one (1) week.

Extensive assignments, large lab projects, extensive quizzes, exams and similar type projects: Normal return time to students in one (1) to two (2) weeks.

RECOMMENDED STUDENT COMPETENCIES/SKILLS

N/A

AUTHORIZED TOOLS

Instructors Policy to Submit Work

To provide students with improved feedback, technical documents shall be submitted electronically via D2L unless approval is received for other methods. To ensure students learn to submit documents electronically, students are required to submit work in Microsoft Word format and follow a pre-define template and format. Students will be asked to meet a goal in data recording and analysis by submitted data plots in Microsoft Word format (after creating in a Microsoft Excel or other professional software format) with the aid of team members and instructor advisement. All individual submissions must be submitted as **one** Microsoft Word or PDF document unless instructed otherwise. Documents that are not legible will be given a grade of zero. NO EXCEPTIONS!

LATE WORK

Labs/Project: Submitting your complete and properly-executed work early is always acceptable. Lab report must be submitted in D2L. Lab report should include signed off (Instructor Sign) page. Late work will get 25% penalty.

Unit exam and Final Exam: If you miss an exam, it cannot be made up unless your absence meets the requirements for an approved absence. Make-up exams may be different from the exam given in class and may be more difficult. Unit Exams and Final Exam CANNOT be made up without strict approval and penalty! If you know in advance that you will miss an exam, special arrangements to re-schedule the exam may be possible for hardship circumstances.

TESTING

The following guidelines will be enforced during proctored exams:

- All materials not required for the exam must be placed off the desk
- Scientific/Engineering Calculators are allowed unless otherwise noted
- Once testing has started you are not allowed to leave the room until you have completed the test. Doing so will immediately end the test for you.
- All material associated with the exam must be submitted upon completion.
- All tests will have a defined time for completion.
- Exceptions may be made to these rules at the instructor's discretion.
- Tests will be proctored by the LASSO center on the OSUIT campus.

OTHER LAB AND CLASSROOM POLICIES

The college environment is one in which various ideas, philosophies, and sensitive topics are explored. The open and respectful pursuit of knowledge will require that each person be allowed to share opinions that may not be popular or accepted by all. Language or gestures that are non-inclusive, derogatory, or disrespectful of diverse backgrounds, cultures, ethnicities, religions, genders, and/or sexual orientations will not be tolerated.

- The use of tobacco in any form is not permitted in the building.
- Cell phones must be turned off unless there is a medical need.
- Audio equipment is not permitted.
- Food and beverage is permitted but not around the equipment. Only liquids with screw type closures are allowed.
- Lab computers are to be used for teaching/learning only. Do not use for entertainment or casual internet surfing or chatting. This is especially true during class.
- Students are expected to maintain a respectful manner during class-sleeping or otherwise assuming a laid down position will not be tolerated.
- Tests will not be given early.
- The lab is considered an industrial environment, therefore you must adhere to proper safety and operations protocols. Do not endanger yourself or others.

Dress Code

- 1. Shoes must cover entire foot.**
- 2. Shorts/Dresses must cover the knees.**
- 3. Tank tops/muscle shirts are not to be worn.**
- 4. Clothing with obscene logos are not to be worn.**
- 5. Clothing that is distracting may not be worn in the classroom setting.**
- 6. Clothing that is baggy should not be worn for safety reasons. Jewelry should be removed in the lab setting.**
- 7. Safety glasses must be worn when appropriate.**

E-Mail Communication Standards

Students are encouraged to use e-mail when communicating personal issues with their instructor. E-mail corruption is a significant problem and unidentified e-mails are simply purged. Therefore a strict standard is necessary to identify a legitimate student communication. The “message line” of student e-mails must contain in order – Subject, Name, Course, and Trimester. Example: **Missing Assignment, John Smith, ETDE 3513, Spring 2017.**

SYLLABUS ATTACHMENT

View the Syllabus Attachment, which contains other important information, by visiting http://osuit.edu/center/student_syllabus_information

Course Schedule			
Course Outline Schedule	Topic	Assignment	Due Date
<i>Week 1</i>	Overview & Basic Principles		
<i>Week 2</i>	Basic Principles 2		
<i>Week 3</i>	Cabling Basics	Lab Report 1	09/22/17
<i>Week 4</i>	Error Detection	Report 1	09/29/17
<i>Week 5</i>	Networking Basics	Exam 1	
<i>Week 6</i>	IP Address and Configuration	Lab Report 2	10/13/17
<i>Week 7</i>	Networking Models	Report 2	10/20/17
<i>Week 8</i>	Networks in Process Automation	Lab Report 3	10/27/17
<i>Week 9</i>	MODBUS & MODBUS Plus	Presentation 1, Report 3	11/03/17
<i>Week 10</i>	HART Communications	Exam 2	11/10/17
<i>Week 11</i>	Foundation Field Bus	Lab Report 4, Report 4	11/17/17
<i>Week 12</i>	SCADA	Presentation 2	11/27/17
<i>Week 13</i>	Wireless Communication	Report 5	12/01/17
<i>Week 14</i>	Wireless Communication		
<i>Week 15</i>	Review	Final Exam	12/13/17

*Schedule is subject to change at instructor discretion.

