# Course Outline

**Course Title:** Industrial Data Communications  
**Semester Course Prefix and Number:** ECM 2235  
**Submitted By:** Scott Norcia  
**Approval Date:** 11/12/2019  
**Old Quarter Course Prefix and Number:**  
**Revision Date:** 10/21/2019

<table>
<thead>
<tr>
<th>Number of Credits:</th>
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<tbody>
<tr>
<td>Number of Lecture Credits:</td>
<td>1</td>
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<tr>
<td>Number of Lab Credits:</td>
<td>2</td>
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<td>Number of Lab Hours:</td>
<td>4</td>
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<td>Class Size:</td>
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**Course Purpose Code:**  
- 0 – Developmental Courses  
- 1 – Non-transferable  
- 2 – Technical course related to career programs  
- 3 – College course which has the primary goal of applying certain concepts (e.g. vocal ensemble)  
- 4 – Other college course not considered a part of MNTC (e.g. computer science, health, physical education)  
- 5 – Course which is intended to fulfill the Minnesota Transfer Curriculum (MNTC) requirements or intended for transfer.  
- 6 – Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

**Catalog Description:**  
The course is a hybrid/blended course with the majority of the learning environment traditional in-class lectures and hands on lab work but also includes Web-based learning activities to complement face-to-face work. This offering is designed to provide the student with a fundamental knowledge of industrial data transmission. Basic standards and protocols will be studied with an emphasis on Ethernet, DH+, Modbus, and Fieldbus. Lab safety and the safe and proper use of tools and test equipment is emphasized.

**Prerequisites and/or recommended entry skills/knowledge:**  
- Course Prerequisite(s): ECM 1252  
- Reading Prerequisite: None  
- Composition Prerequisite: None  
- Mathematics Prerequisite: None

**Career Programs and Transfer Majors Accessing this Course:**  
- Electrical Controls and Maintenance Diploma  
- Electrical Controls and Maintenance AAS

**Minnesota Transfer Curriculum Goal(s) partially met by this course if applicable:**  
(Notes: No more than two goals may be met by any one course. AASC review and the Chief Academic Officer's approval are required.)  
0.  
1. Communications  
2. Critical Thinking  
3. Natural Sciences  
4. Mathematical/Logical Reasoning  
5. History and the Social and Behavioral Sciences  
6. The Humanities and Fine Arts  
7. Human Diversity  
8. Global Perspectives  
9. Ethical and Civic Responsibility  
10. People and the Environment

**Learning Outcomes:** (including any relevant competencies listed in the Minnesota Transfer Curriculum)
Upon completion of this course, the student will be able to:

1.) Differentiate between industrial network protocols.
2.) Comprehend industrial network terminology.
3.) Compare and contrast network communications and traditional hardwired systems.
4.) Comprehend LAN wiring.
5.) Utilize a lab based LAN.
6.) Integrate a PLC based control system utilizing Ethernet/IP.
7.) Understand discrete I/O management through DeviceNet.
8.) Observe proper safety procedures.
9.) Work cooperatively.
10.) Apply critical thinking skills.

**Student Assessment Methods May Include:**
Will be determined by the Instructor.
Lab assignments, worksheets, papers, and tests.

**Use of Instructional Technology May Include:** (includes software, interactive video and other instructional technologies):

Power Point Software, videos, software based lab simulators.

**Additional Special Information:** (special fees, directives on hazardous materials, etc.)

Laptop Computer Lease and Required Tool List

**Transfer Information:** (Please list colleges/majors that accept this course in transfer.)

**Affiliated Mesabi Range College Courses and Programs:**

**Approvals:**

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<tr>
<th>Body</th>
<th>Representative Signatures</th>
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<tbody>
<tr>
<td>Faculty Association</td>
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Distribution: Original – Instructional Services
Copies: Transfer Specialist, Originating Faculty Member, Records
Revised: February 2019