Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. MECH    COURSE NUMBER: 2126

NUMBER OF CREDITS: 4   Lecture: 4   Lab: 0

<table>
<thead>
<tr>
<th>Course Title:</th>
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<tr>
<td>Systems Analysis</td>
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<tr>
<th>Catalog Description:</th>
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<td>Provides students with the knowledge of how fluid power components interact with each other in systems and determine causes of malfunction.</td>
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FULFILLS MN TRANSFER CURRICULUM AREA(S)
Goal 1: Communication: _____ by meeting the following competencies:

Goal 2: Critical Thinking: _____ by meeting the following competencies:

Goal 3: Natural Sciences: _____ by meeting the following competencies:

Goal 4: Mathematics/Logical Reasoning: _____ by meeting the following competencies:

Goal 5: History and the Social and Behavioral Sciences: _____ by meeting the following competencies:

Goal 6: The Humanities and Fine Arts: _____ by meeting the following competencies:

Goal 7: Human Diversity: _____ by meeting the following competencies:

Goal 8: Global Perspective: _____ by meeting the following competencies:

Goal 9: Ethical and Civic Responsibility: _____ by meeting the following competencies:

Goal 10: People and the Environment: _____ by meeting the following competencies:

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<tr>
<th>Prerequisites or Necessary Entry Skills/Knowledge:</th>
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<tr>
<td>Successful completion of year one of the Mechatronics diploma or A.A.S. degree program or equivalent work experience.</td>
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### Topics to be Covered

1. Pump unloading systems.
2. Load locking circuits.
3. Filtration.
4. Component failure analysis.
5. Open/closed center circuits.
6. Circuit safety measures.
7. Circuits with open and closed loop pumps.
8. Counterbalance, sequencing, mobile vehicles and braking circuits.
9. Internal/external drain and pilot for control valves.
11. Compressor controls.
12. Pressure drop in air distribution systems.
13. Circuits incorporating accumulators and gear reducers.

### Student Learning Outcomes

1. Determine information required to analyze hydraulic and pneumatic systems.
2. Identify how circuit components affect one another.
3. Describe the effects of various pressure, flow, and directional control.
4. Troubleshoot fluid power components and systems.
5. Determine uses for various types of control.
6. Implement fluid power safety techniques.
7. Identify component failure.
8. Demonstrate pump unloading techniques.
9. Calculate filtration requirements.
10. Analyze electro-pneumatic systems.

### Is this course part of a transfer pathway:

- Yes [ ]
- No [x]

Revised Date: 05/2020