NORTHEASTERN TECHNICAL COLLEGE
COURSE OUTLINE

COURSE: IMT 131
PREFIX NO. 131
EFFECTIVE DATE August 2013
NEXT REVIEW DATE August 2014

TITLE: Hydraulics & Pneumatics
CREDITS 4
CONTACTS 4 0 4
CLASS - LAB - TOTAL

PREREQUISITES: None

DESCRIPTION: LEVEL I: This course covers the basic technology and principles of hydraulics and pneumatics (IMT 132 plus IMT 133).

LEVEL II: Upon completion of this course, the student should understand the basic principles of hydraulics and pneumatics and be able to install, maintain, and repair industrial hydraulic and pneumatic systems. This will include pumps, motors, valves, flow meters, pressure gauges, and other system components.

TEXTBOOK(S) OR ALTERNATIVE: Industrial Hydraulics Manual; Fluid Power; Eaton; published by Vickers Technical Training Center.

MATERIALS (specifying those to be purchased by student): None

COLLATERAL READING:
- Industrial Hydraulic Technology (Parker-Hannifin Corp.)
- Industrial Pneumatics Technology (Parker-Hannifin Corp.)
- Practical Fluid Power Control (Womack Educational Publications)

CLASS MANAGEMENT ACTIVITIES (Attendance, tardies, testing, etc.):
ATTENDANCE: Absences in excess of 20% (18 class hours) will result in being dropped for excessive absenteeism. Due to varying class times by the schedule, attendance will be monitored by the hour.

ACADEMIC DISHonesty: Students are expected to do their own work. Please refer to the NETC Student Code and Grievance Procedure for a definition of academic dishonesty and an outline of the disciplinary action that may result therefrom.

DISABILITIES STATEMENT: Students with disabilities are encouraged to contact the Vice President for Student Services to discuss needs or concerns as they pursue an academic program and participate in campus life. The Vice President for Student Services will provide guidance regarding official documentation of disabilities and/or accommodation of needs. (See Catalog)

STUDENT ID:
It is mandatory that every student wear his or her student ID at all times when on the Cheraw campus.

During the first week of classes, the instructor will issue a reminder to wear the ID. This reminder is a warning. After the first
week of classes, instructors are required to dismiss students without ID from class. The student may get his/her ID (or a new one in Student Services for $3.00) and return to class before the midpoint of the class. If the student cannot get an ID and returns to class by the midpoint, the instructor will record the absence.

**RESOURCES (A-V, persons, tools/equipment):**
Technical Systems, Inc. hydraulic/pneumatic workbench with guided experiments.

Slide presentations - Hydraulic Systems Maintenance  
- Hydraulic Systems Troubleshooting

Videotape - Industrial Hydraulics Technology (Chapters 1 and 2)

TPC Training Manuals - Basic Hydraulics  
- Hydraulic Troubleshooting  
- Pneumatic Troubleshooting

Vega Hydraulic Transparencies

Class handouts

**COURSE TOPICAL OUTLINE**  (List topics and sub-topics of course) and **Calendar** or approximate length of time devoted to topic.

### TENTATIVE COURSE OUTLINE

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<th>WEEK</th>
<th>TOPIC</th>
<th>TEXT CHAPTER</th>
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<td>1-2</td>
<td>Hydraulic Theory and Operating Principles</td>
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<td>3-4</td>
<td>TEST (Theories and Principle of Hydraulics)</td>
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<tr>
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<td>Hydraulic Pumps</td>
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<td>5-6</td>
<td>Hydraulic Control Valves</td>
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<td>7</td>
<td>Hydraulic Control Valves</td>
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<td>8-9</td>
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<td>Hydraulic Actuators</td>
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<td>10-12</td>
<td>Hydraulic Accumulators and Accessories</td>
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<tr>
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<td>Hydraulic Reservoirs, Fluids, Fluid Conditioners</td>
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<td>Hydraulic Piping and Sealing</td>
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<tr>
<td>13-14</td>
<td>TEST (Fluids/Piping/Reservoirs)</td>
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<tr>
<td>15</td>
<td>Pneumatics Theory and Operating Principles</td>
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**Final Exam**
OBJECTIVES OF COURSE:
1. Read and interpret hydraulic schematics, including naming and describing the function(s) of components.
2. Explain the proper operation of various pumps, valves, and actuators.
3. Understand and discuss the basic principles of hydraulics, including Pascal's Law, Bernoulli's Principle, and the force/pressure/flow relationships.
4. Explain the similarities and differences between hydraulic and pneumatic systems.
5. Troubleshoot systems

INSTRUCTIONAL METHODS TO COMPLETE OBJECTIVES:
1. Lecture
2. Class discussion
3. Review of end-of-chapter questions
4. Experimental activities on TSI workbench
5. Disassembly and reassembly of components

EVALUATIVE METHODS TO APPRAISE OBJECTIVES:
1. Instructor's evaluation of class/lab participation
2. Quizzes, “Major” tests and a final exam

The numerical average will be based on:
1) Chapter quizzes (Count top ten scores only) 40%
2) "Major" tests (3) See Schedule 40%
3) Final Exam 10%
4) Class/Laboratory Activity 10%

GRADING: Grading will be done on the following scale:
90 - 100 = A
80 - 89 = B
70 - 79 = C
60 - 69 = D
Below 60 = F