International ROV Curriculum Focused on 2-Year Colleges

Memorial University, St. John’s Newfoundland
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International ROV Curriculum

- Provide a comprehensive curriculum that will cover defined ROV competencies.
  - MATE ROV Workforce competencies
  - Oceaneering ROV Technician competencies
  - IMCA ROV Technician competencies

- Electrical Engineering Technology – Provides the foundation for work in multiple sectors of the economy.

- Build upon existing programs in defining the Guidelines.
  - Memorial University ROV Curriculum
  - Long Beach City College State Approved Electrical Curriculum
  - Others...
If you understand how to build an ROV, what else can you do?

DOL’s Mechatronic Competency Model

Mapping Competencies to Occupations

- Curriculum utilizes the ROV industry to provide the applied framework and hands on training.

- This curriculum is not limited to the ROV Technician. It will provide mapping to foundational skills/knowledge required in multiple industries & occupations.
  - Factory Automation & Manufacturing
  - Robotics Technician
  - Wind Power Technician
  - Industrial Maintenance Technician
Transfer Path to 4 Year University

- Very limited transfer options exist for students in this field without having to take the entire Calculus and Physics series of classes.

- Examples - Technology Degrees 2 + 2
  - Memorial University
  - Cal State University Dominguez Hills

- Additional transfer opportunities needed that will:
  - Develop advanced technology skills
  - Develop technology management skills
Assessment Pathway for Incumbent Workers

- Utilize developed assessments to allow workers to “test out” of many of the entry level competencies.
- Demonstrate hand’s-on skill along with knowledge assessment.
- This process can also be utilized for those coming from other programs wishing to receive credit by exam.
  - High School students
  - Transfer students
Digging In

- Three main areas of study divided into 15 groups and 538 topics.
  - Foundational Topics
  - Technical Topics
  - Advanced Topics
Foundational Topics

- **Math** – Basic Math through algebra & trigonometry up to preCalculus

- **Communication Skills** – Technical communication

- **Science** – Basic Physics
Technical Topics

- Safety
- CAD & Blueprint Reading
- Electrical
- Electronics
- Electrical Control Systems
- Automation Controllers (Microprocessors and Programmable Logic Controllers)
- Electrical Code & Regulations
- Fluid Power
- Machine Design & Fabrication
- Fiber Optics
Advanced Topics

- ROV Materials
- ROV Operations
### Topic Layout

- Topics are divided into fifteen groups
- Each topic is identified as a level 1, 2 or 3

<table>
<thead>
<tr>
<th>Level</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>149</td>
<td><strong>Electrical</strong></td>
</tr>
<tr>
<td>150</td>
<td>Ohm's Law, electrical circuit theory</td>
</tr>
<tr>
<td>151</td>
<td>Electrical diagrams, symbols, and nomenclature</td>
</tr>
<tr>
<td>152</td>
<td>Electrical characteristics, polarity, electron flow, voltage drops, power loss.</td>
</tr>
<tr>
<td>153</td>
<td>Basic Ohm's Law formulas</td>
</tr>
<tr>
<td>154</td>
<td>Series circuits / diagrams</td>
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<tr>
<td>155</td>
<td>Series circuits; wiring, measurements and proper operation</td>
</tr>
<tr>
<td>156</td>
<td>Parallel circuits / diagrams</td>
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<td>157</td>
<td>Parallel circuits; wiring, measurements and proper operation</td>
</tr>
<tr>
<td>158</td>
<td>Combination circuits / diagrams</td>
</tr>
<tr>
<td>159</td>
<td>Combination circuits; wiring, measurements and proper operation</td>
</tr>
<tr>
<td>160</td>
<td>Troubleshooting techniques</td>
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</tbody>
</table>
## Topic Layout

<table>
<thead>
<tr>
<th>Level</th>
<th>Description of Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General course work that could be offered at most colleges</td>
</tr>
<tr>
<td>2</td>
<td>More specialized course work that requires higher levels of equipment &amp; training</td>
</tr>
<tr>
<td>3</td>
<td>Highly specialized ROV coursework, requiring significant equipment support</td>
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</tbody>
</table>
Today’s Goals

• Review of Topic List

• Identify additional Topics

• Remove extraneous/redundant Topics and ensure proper placement in Levels 1, 2 and 3
Future Work

- Formalize today’s list for further review.
- Develop Student Learning Outcomes and assessment methods for each topic.
- Develop a bank of questions for each topic that can be utilized for assessments.
- Develop a bank of performance assessments for hands on demonstrations.