# Agricultural Mechanics Credential

## Table of Contents

<table>
<thead>
<tr>
<th>Electrical</th>
<th>Small Engines</th>
<th>Welding</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-1 Wire preparation……1</td>
<td>PT-1 Oil and gas..............62</td>
<td>PT-1 Tool ID........................91</td>
</tr>
<tr>
<td>PT-2 Dressing a Panel……4</td>
<td>PT-2 Tool ID .........................66</td>
<td>PT-2 Oxy/ Acetylene..................94</td>
</tr>
<tr>
<td>PT-3 Pull Chain lighting…..5</td>
<td>PT-3 Starting/stopping……69</td>
<td>PT-3 Grinding… ....................98</td>
</tr>
<tr>
<td>PT-4 Single Pole switches…12</td>
<td>PT-4 Carburetors .................71</td>
<td>PT-4 Flat plate beads...............100</td>
</tr>
<tr>
<td>PT-5 Three-Way lighting…19</td>
<td>PT-5 Starer rope repair…73</td>
<td>PT-5 T-joint flat… ...............102</td>
</tr>
<tr>
<td>PT-6 Branch lighting.........26</td>
<td>PT-6 Spark plugs...............76</td>
<td>PT-6 Horizontal beads..............104</td>
</tr>
<tr>
<td>PT-7 Remote lighting........33</td>
<td>PT-7 Armatures ..................79</td>
<td>PT-7 T-joint horizontal,,........106</td>
</tr>
<tr>
<td>PT-8 Receptacles............43</td>
<td>PT-8 Air filters .................81</td>
<td>PT-8 Beveling plate...............108</td>
</tr>
<tr>
<td>PT-9 GFCI’s....................52</td>
<td>PT-9 Torque ......................84</td>
<td>PT-9 Mig setup &amp; weld...........110</td>
</tr>
<tr>
<td>PT-10 Multimeter ............58</td>
<td>PT-10 OHV Setting ..........87</td>
<td>PT-10 Pipe on pipe on plate ....113</td>
</tr>
</tbody>
</table>
Agricultural Mechanics
Performance Tests Checkoff

Student Name ____________________________

School ________________________________

Ag Teacher Name _________________________

<table>
<thead>
<tr>
<th>Electrical</th>
<th>Date Completed</th>
<th>Small Engines</th>
<th>Date Completed</th>
<th>Welding</th>
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<tbody>
<tr>
<td>PT-1</td>
<td></td>
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<td>PT-2</td>
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<td>PT-3</td>
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<td>PT-5</td>
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This form indicates completion of every performance test aligned with the credential. All PT’s must be completed and documented using this form before the student can register for a validity exam at their district testing center.

Validity exams are only available at district testing centers approved by the Louisiana FFA. The student will be randomly assigned by software 2 PT’s from each discipline to perform on-site.

The student must complete all 6 randomly drawn PT’s on-site to the judges satisfaction to earn the credential.
The student performs the following steps to prepare wire for installation.

1. Remove 6” of nonmetallic cover of Romex cable (20 times correctly in class)

2. Remove correct amount of insulation from each Conductor (3/4”). [20 times correctly in class]

3. Create a pig tail with two 14/2 Romex conductors (20 times correctly in class)
4. Create a pig tail with three 14/2 Romex conductors (20 Times correctly in class)

5. Prepare terminal loop for installation i.e., lights, light switch, duplex receptacle (20 times correctly in class)

6. Twist four ground wires together (20 times correctly in class)
7. Install wire loops on each device listed in step 5. ___ ___ ___
Performance Test 2  
**Dressing a panel**

Name ___________________ Date ___________________ Class ___________________

The student performs the following steps to prepare wire for installation.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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<tbody>
<tr>
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</table>

1. **Student can remove the proper amount of insulation (½”) from a hot wire to properly connect a hot wire to a breaker**
   - YES
   - NO
   - N/A

2. **Student can connect a single pole and double pole breaker to a bus**
   - YES
   - NO
   - N/A

3. **Student can identify the: hot wire, neutral wire, Ground wire, breaker bus, neutral bar, main Neutral, main power, main ground, single Pole breaker, double pole breaker, Cable connector, knock out**
   - YES
   - NO
   - N/A

4. **Student can connect 14 gauge hot wire to a single Pole breaker**
   - YES
   - NO
   - N/A

5. **Student can properly secure 14/2wg in a cable connector, remove the proper amount of romex, connect a hot wire to the 15A single pole breaker, neutral and ground wires to the neutral bar, connect the breaker to the bus**
   - YES
   - NO
   - N/A

6. **Student can properly secure 12/3wg in a cable connector, remove the proper amount of romex, connect both hot wires to the double pole breaker, and coated ground wire to the neutral bar, connect the double pole breaker to the bus**
   - YES
   - NO
   - N/A
15 amp circuit – pull chain lighting
Performance Test for circuit #1

Name ___________________ Date _______________ Class ___________________

The student performed the following.

1. Student properly dressed the breaker panel
   With 14/2 wg and ran the romex to the
   Octagonal junction box

   YES   NO   N/A
   ____   ____   ____
2. All Romex is properly secured in cable connectors  

3. 6” of insulation was properly removed from the Source cable inside the junction box
4. The terminal loops are connected properly

5. The circuit is properly grounded
6. Circuit is ran correctly and has function. Student checked the circuit with a continuity tester.
15 amp circuit – 2 hot pull chain lights
7. Circuit is ran correctly and has function. The student checked for continuity with a tester.
PT-4

15 amp circuit – light controlled by a single pole switch
<table>
<thead>
<tr>
<th>Performance Test 4</th>
<th>Single Pole Switches</th>
</tr>
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<tbody>
<tr>
<td>Name</td>
<td>Date</td>
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The student performed the following.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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</table>

1. Student properly dressed the breaker panel with 14/2 wg and ran the romex to the metal switch box

   ____  ____  ____
2. All Romex is properly secured in cable connectors

3. 6” of insulation was properly removed from the Source cable inside the junction box and switch box
4. The terminal loops are connected properly

5. The circuit is properly grounded
6. The switch is connected properly. The circuit has function. The student checked the circuit with a continuity tester.
15 amp circuit – two lights controlled by a single pole switch
7. Circuit is ran correctly and has function. Student checked the Circuit with a continuity tester.
PT-5
15 amp circuit – light controlled by three way switches
Performance Test 5  
3-way lighting

Name __________________________ Date _______________ Class ______________________

The student performed the following.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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</table>

1. Student properly dressed the breaker panel with 14/2 wg and ran the romex to the metal switch box

___  ___  ___
2. All Romex is properly secured in cable connectors

3. 6" of insulation was properly removed from the Source cable inside the junction box and switch box
4. The terminal loops are connected properly

5. The circuit is properly grounded in metal box and to
   The device when ran in plastic boxes
6. The circuit is completed properly and has function. One common is connected to the breaker and the other common is connected to the light. Travelers are connected to each other. Neutrals connected from the light back to bus. Student checked circuit with continuity tester.
PT 6

15 amp circuit – light controlled by three way switches, branch from the junction box, no switch loop
Performace Test 6

Branch lighting

Name ___________________ Date ______________ Class ___________________

The student performed the following.

1. Student properly dressed the breaker panel with 14/2 wg and ran the source cable to the metal junction box

   YES  NO  N/A

   ____  ____  ____
2. All Romex is properly secured in cable connectors

3. 6” of insulation was properly removed from the Source cable inside the junction box and switch box
4. The terminal loops are connected properly
5. The circuit is properly grounded in metal box and to
   The device when ran in plastic boxes
6. The circuit is completed properly and has function. One common is connected to the breaker and the other common is connected to the light. Travelers are connected to each other. Neutrals connected from the light back to bus. Student checked circuit with continuity tester.
PT-7

15 amp circuit – remote light controlled by single pole switch
Performance Test 7
Remote Lighting

Name __________________ Date ___________ Class __________________

The student performed the following.

YES NO N/A

1. Student properly dressed the breaker panel
   with 14/2 wg and ran the source cable to the
   metal junction box

   _____ _____ _____
2. All Romex is properly secured in cable connectors

3. 6" of insulation was properly removed from the Source cable inside the junction box and switch box
4. The terminal loops are connected properly
5. The circuit is properly grounded in metal box and to
   The device when ran in plastic boxes
6. The circuit is completed properly and has function. White wire being used as a source to the switch is marked with tape. Student checked circuit with a continuity tester.
15 amp circuit – light controlled by three way
switches, run source to the junction box and run
A loop between the switch boxes
7. The circuit is completed properly and has function. One common is connected to the breaker and the other common is connected to the light. Travelers are connected to each other. Neutrals connected from the light back to bus. Student checked circuit for continuity with a tester.
PT-8
15 amp circuit – 1 receptacle
<table>
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<tr>
<th>Performance Test 8</th>
<th>Receptacles</th>
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<tbody>
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<td>Name _______________ Date _______________ Class ____________________</td>
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</table>

The student performed the following.

1. Student properly dressed the breaker panel  With 14/2 wg and ran the romex to the  First switch box

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<thead>
<tr>
<th>YES</th>
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<th>N/A</th>
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</table>
2. All Romex is properly secured in cable connectors

3. 6” of insulation was properly removed from the Source cable inside the box
4. The terminal loops are connected properly
5. The circuit is properly grounded
6. Connections are twisted and under a wire nut.
7. Circuit is ran correctly and has function. The student checked the circuit with a continuity tester. The hot wire is connected to the brass colored screw and the neutral is connected to the silver colored screw.
8. Circuit is ran correctly and has function. Student checked circuit with a continuity tester. The hot wire is connected to the brass colored screw and the neutral is connected to the silver colored screw. NEC Neutral code is followed.
PT-9
15 amp circuit – 1 GFCI
Performance Test 9 | GFCI

Name ____________________ Date ___________ Class ____________________

The student performed the following.

<table>
<thead>
<tr>
<th>YES</th>
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</table>

1. Student properly dressed the breaker panel
   With 14/2 wg and ran the romex to the
   First switch box

   __   __   __
2. All Romex is properly secured in cable connectors

3. 6” of insulation was properly removed from the Source cable inside the box
4. The wires are back loaded

5. The circuit is properly grounded

6. Circuit is ran correctly and has function. The student checked the circuit with a continuity tester. The hot wire is connected to the brass colored screw and the neutral is connected to the silver colored screw
15 amp circuit – GFCI protecting an outlet
7. Circuit is ran correctly and has function. Student checked the circuit with a continuity tester. The source from the breaker panel is connected to the “line” side of the GFCI and the receptacle is connected to the “load” side.
Performance Test 10
Multi-meter

Name __________________ Date _______________ Class __________________

The student performed the following.

1. Student tested a AAA battery for voltage
   
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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2. Student tested AAA battery for current
   
<table>
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<th>YES</th>
<th>NO</th>
<th>N/A</th>
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3. Student tested a 9 volt battery for voltage
   
<table>
<thead>
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<th>YES</th>
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</table>
4. Student tested a 9 volt battery for current

![Image of multimeter reading 9.1 V]

5. Student tested a 6 volt battery for DC voltage

![Image of multimeter reading 3.6 V]

6. Student tested a 6 volt battery for current

![Image of multimeter reading 3.6 V]
7. Student tested a 24” piece of 12 gauge wire for resistance _____ _____ _____

8. Student tested a 24” piece of 14 gauge wire for resistance _____ _____ _____

9. Student tested an entire roll of 12 gauge wire for resistance _____ _____ _____
10. Student tested an entire roll of 14 gauge wire for resistance ____  ____  ____

11. Student tested a cell phone charger for resistance  ____  ____  ____
Performance Test #1

Oil and gas

Name __________________ Date _____________ Class __________________

The student performed the following.

1. Student locates the oil systems fill caps & drain plugs and demonstrates how to remove/replace both

   YES  NO  N/A

2. Student identifies an engine that needs oil by both reading the oil dipstick and looking at the threads

   YES  NO  N/A
3. Student adds oil to an empty engine and checks for the proper amount without spilling.

4. Student drains the oil from a full engine without spilling.
5. Student checks an empty gas tank, a tank with gas, can add fuel, can drain the tank completely.
6. Student can turn fuel valve on/off between the tank and carburetor.
<table>
<thead>
<tr>
<th>Performance Test 2</th>
<th>Tool ID</th>
</tr>
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<tbody>
<tr>
<td>Name</td>
<td>Date</td>
</tr>
<tr>
<td>The student performed the following.</td>
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</tr>
<tr>
<td>1. Student identifies the following pliers</td>
<td></td>
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<tr>
<td><img src="pliers.png" alt="Pliers Image" /></td>
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<tr>
<td>2. Student identifies the following drivers</td>
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<td><img src="drivers.png" alt="Drivers Image" /></td>
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</tr>
</tbody>
</table>
3. Student identifies the following hammers

4. Student identifies the following by drive size and name
   (ex. 1/4” drive ratchet, socket extension ½” drive,
   foot pound torque wrench)
5. Student identifies the following wrenches

6. Student identifies the following specialized tools
Performance Test #3

Starting and stopping an Engine

Name __________________ Date ______________ Class ___________________

The student performed the following.

1. Student turns the engine kill switch off and on and can identify the difference

   YES  NO  N/A

   ___  ___  ___

2. Student turns the choke off and on and can identify the difference

   YES  NO  N/A

   ___  ___  ___
3. Student can start an engine, throttle it up and down and stop the engine.
The student performed the following.

1. Student disassembles a float/bowl type carburetor
   
   YES  NO  N/A
   ___  ___  ___

2. Student identifies the float, needle valve, main jet, choke, throttle
   
   YES  NO  N/A
   ___  ___  ___
3. Student reassembles the float/bowl carburetor
Performance Test #5

Starter rope repair

Name __________________ Date _______________ Class __________________

The student performed the following.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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1. Student disassembles a starter rope from the rewind

2. Student recoils the pulley properly and locks it into place
3. Student preps the starter rope, inserts it into the housing + pulley, ties a knot
4. Student pulls the rope tight, releases the screwdriver and recoils the rope
The student performed the following:

1. Student removes the spark plug cap

<table>
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<tr>
<th>YES</th>
<th>NO</th>
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2. Student removes the spark plug

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<th>YES</th>
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</table>
3. Student checks the spark plug gap with the correct feeler gauge and can fix a spark plug gap too large or too small.
4. Student replaces the spark plug and connects the cap
Performance Test #7

Name __________________ Date ________________ Class __________________

The student performed the following.

1. Student removes the engine parts covering the armature, locates the armature and loosens the two bolts connecting it to the engine  

   YES  NO  N/A
2. Student rotates the magnet of the flywheel out of the way and uses a gauge to set the armature gap according to the engine specifications.

3. Student tightens the armature bolts while maintaining the proper armature gap.
Performance Test #8

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Class</th>
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</table>

The student performed the following.

1. Student removes the engine parts housing the air filter

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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</thead>
</table>
2. Student removes the air filter and inspects for damage
3. Student replaces the filter with a new one if necessary and re-assembles the parts housing the filter
Performance Test #8 Torque Head Bolts and Flywheel Nut

Name __________________ Date ______________ Class __________________

The student performed the following.

1. Student removes the engine parts to access the head bolts
   - YES □ NO □ N/A □

2. Student loosens the head bolts (do not remove the head bolts)
   - YES □ NO □ N/A □

3. Student sets an adjustable torque wrench to 100-inch pounds and tightens each bolt in a criss-cross pattern at 100 inch-pounds
   - YES □ NO □ N/A □

Make sure it clicks!
4. Student sets an adjustable torque wrench to 150-inch pounds and tightens each bolt in a criss-cross pattern at 150 inch-pounds

5. Student sets an adjustable torque wrench to 210-inch pounds and tightens each bolt in a criss-cross pattern at 210 inch-pounds

6. Student repeats the entire process: loosen, torque head bolts properly with a dial type inch pound torque wrench

7. Student removes the engine parts necessary to locate the flywheel
8. Student secures the flywheel with a strap wrench or tool designed to lock the drive shaft in place

9. Student sets an adjustable foot pound torque wrench to 55 foot-pounds and torques the flywheel nut

Make sure it clicks!
The student performed the following.

1. Student properly distinguishes the four strokes by piston and valve placement. Can explain each stroke:

   - [ ] YES
   - [ ] NO
   - [ ] N/A
2. Student identifies top dead center TDC and $\frac{1}{4}$” past TDC of the piston

3. Student removes the valve cover, identifies intake and exhaust valves
4. Student removes the adjustment screws (acorn nut) from the rocker arm including the inserted allen nuts (900) and the extra adjustment nut on the 950.

```
remove
```

5. While ¼” past TDC, student sets the exhaust valve using the proper feeler gauge.

```
900 engine .009 - .011 in
```

```
950 engine 0.006 - 0.008 in
```
6. While ¼” past TDC students sets the intake valve using the proper feeler gauge.

7. Student replaces the valve cover.
Performance Test #1

Name __________________ Date ______________ Class __________________

The student performed the following.

YES  NO  N/A

1. Student identifies with 100% accuracy chipping hammer, ball-peen hammer, vice-grip c-clamp, vice grip straight-jaw, tip cleaners, striker, wire brush, c-clamp
2. Student identifies with 100% accuracy framing square, level, punch, crescent wrench, tape measure, speed square
3. Student identifies with 100% accuracy angle grinder, file, wire wheel, rock, flapper disk, and torch body
Performance Test #2

Name ___________________ Date _____________ Class ___________________

The student performed the following.

1. Student can properly move/roll an oxygen bottle

   YES   NO   N/A
   __    __   ____
2. Student can remove, clean, resurface and replace a torch tip
3. Student can set oxy/acetylene gauges, and explain what each is for.
4. Student can light an oxy/acetylene torch and properly set a neutral flame with oxygen cutting jet opened  

5. Student can cut a 6” straight line and a 1” circle with an oxy/acetylene torch
Performance Test #3

Name __________________ Date _______________ Class __________________

The student performed the following.

1. Student can properly identify, inspect and wear PPE for grinding, cutting and welding

   YES  NO  N/A

   ___  ___  ___
2. Student can hand grind safely
Performance Test #4

The student performed the following.

1. Using a 6010 rod, Student can weld a 4”x6” plate in the flat position
   All beads are tied in, there are no major gaps
   YES  NO  N/A
2. Using a 7018 rod, student can weld a 4”x6” plate in the flat position
   All beads are tied in, there are no major gaps
Performance Test #5

Name ________________ Date ______________ Class ________________

The student performed the following.

1. In the flat position student can weld a T-joint with a root plus a two beaded cap with a 6010 rod

   YES  NO  N/A
   ___  ___  ___
2. In the flat position student can weld a T-joint with a root plus a two beaded cap with a 7018 rod
Performance Test #6
Name ___________________ Date _______________ Class ___________________

The student performed the following.

1. Using a 6010 rod, Student can weld a 4”x6” plate in the horizontal position
   All beads are tied in, there are no major gaps

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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</table>
2. Using a 7018 rod, student can weld a 4”x6” plate in the horizontal position
   All beads are tied in, there are no major gaps
Performance Test #5

Name ___________________ Date _______________ Class ___________________

The student performed the following.

1. In the horizontal position student can weld a T-joint with a root plus a two beaded cap with a 6010 rod

   YES  NO  N/A

   ___  ___  ___
2. In the horizontal position student can weld a T-joint with a root plus a two beaded cap with a 7018 rod
The student performed the following.

1. Student can prepare beveled plates thermally.
2. Student can Prepare beveled plates mechanically.
Performance Test #9

Name ______________________ Date _______________ Class ______________________

The student performed the following.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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<tbody>
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</table>
3. Student can perform a suitable fillet weld on flat bar with MIG
4. Student can properly center, square up and weld two pieces of square tubing
Performance Test #10

Name _______________ Date ______________ Class ___________________

The student performed the following.

1. Student can mark a saddle in pipe, cut it and prep it

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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2. Student can fit, tack and weld saddled side to pipe and flat side plate