Lacombe Composite High School

**CTS Strand: Electro-Technologies**

**Course: ELT1080: Control Systems**

**Teacher:Mr. Schultz (**[**steven.schultz@wolfcreek.ab.ca**](mailto:steven.schultz@wolfcreek.ab.ca)**) (782-6615 Ex:5205**

**Student:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Due Date:\_\_\_\_\_ Final Module Mark:\_\_\_\_\_%**

**ELT 1010 is a prerequisite for this course.**

**Time**

**Depending on your experience and the completion of past competencies, this module will take approximately 25 hours (including instructional learning time taken from handouts, books, internet, demonstrations, videos etc.) Your total Hrs. \_\_\_\_\_\_\_\_\_\_\_\_\_**

## Learner Expectations

***When you complete this module you as a learner will be able to***:

* Identify how control systems are used in residential & commercial settings
* Identify & explain basic process control systems.
* Construct a basic process control system.
* Explain process control terms
* Measure voltage, current & resistance in a control system; Test for opens and shorts
* Demonstrate safe lab procedures
* Demonstrate basic skills & competencies.

Students develop an understanding of the electrical components, soldering, cable connections and electronic careers.

**Evaluation**

Theory 40%

Practical 40%

Habits & Ethics 20%

**Resources:**

**Lecture Notes & Demonstrations**

**NIDA Software:**

### Activities:

In this module students are expected to:

i.) Complete the research/theory assignments.

ii.) Complete the practical jobs assigned.

iii.) Maintain a notebook containing the learning activities and test results.

Assignment List

# **Research/Theory Assignment List (40%):**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assignment** | **LESSON** | **Date Completed** | **Average Mark** | **Teachers Initials** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | NA |  |  |  |

**Practical Assignment List (40%):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Job** | **Date Completed** | **Mark out of 9** | **Teacher Initials** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Work Habits & Safety Habits (20%):**

|  |  |  |  |
| --- | --- | --- | --- |
| **HABIT** | **Date Completed** | **Mark out of 9** | **Teacher Initials** |
| Work Habits |  |  |  |
| Safety Habits |  |  |  |

\*Make sure you have all the values recorded neatly and accurately for each of these jobs. You will need to present them to the teacher when being marked or no mark will be assigned.

SELF/TEACHER EVALUATION

The knowledge gained from studying Electronics is important, but equally if not more important are the fundamental, teamwork and personal management skills required to work effectively and safely in a shop with other people. The skills listed on this evaluation sheet are worth 20% of your final mark in each module. Read the numbering key, then apply the number you feel suits you best in each of the descriptors. Be honest. If I disagree I’ll place my mark beside the one you gave yourself, and that will be the one recorded on your report card.

|  |  |
| --- | --- |
| **Key** | |
| 1 - 3 | **Seldom**—I rarely or almost never do it—I forget or just don’t bother with it. |
| 4 | **Not Frequent**—I make little attempt to perform this task—I do it less than half the time. |
| 5 - 6 | **I do it but I need frequent reminders** from the teacher, my parents or classmates. I do it but I let others share the responsibility instead of taking responsibility for it myself. |
| 7 | **Most of the time**—I do it most of the time but sometimes I forget or choose not to do it. |
| 8 | **Frequently**—Almost all the time—Occasionally I don’t do it. I don’t do it because I forget or choose not to but this is rare. |
| 9 | I **Always** do it unless I have a really good reason. I never just forget or don’t bother with it. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Fundamental & Teamwork Skills Evaluation** | **Grade / 9** | | **AVERAGE / 9** |
| Description | Student | Teacher |  |
| I manage information by writing down **neat and organized** notes and instructions and working steadily on my assignment till it is **completed to the best of my ability and handed in.** |  |  |
| I now how to use **numbers** in mathematical expressions and to communicate numerical values. |  |  |
| I **communicate clearly** and thoroughly with my teacher and classmates by **asking questions**, **clarifying instructions** and demonstrating clear **understanding** in assignments and quizzes. |  |  |
| I **think and solve problems** by staying **focused** on assigned tasks and only asking for help after I have made **several attempts** to solve the problem. |  |  |
| I **work well with others** and participate **equally** in group projects and tasks. |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Personal Management Skills Evaluation** | **Grade / 9** | | **AVERAGE / 9** |
| Description | Student | Teacher |  |
| I demonstrate **positive** **attitudes and behaviors** such as **staying on task,** **not distracting** others, and participating in **clean up.** |  |  |
| I demonstrate **safety** by doing an a**nalysis** before I start, using **tools properly**, **not fooling around**, working with **care,** and wearing my **PPE** |  |  |
| I am a r**esponsible** student in class, who a**ttends** class on **time,** r**espects** others and the equipment and follows the expectations outlined in the **school handbook.** |  |  |
| I am **adaptable**. When the situation c**hanges** I do **not complain**, but try to r**eadjust** and positively **fit** into the new situation. |  |  |
| I **learn continuously** by r**eattempting** a task or assignment if I have not mastered it the first time, and using my free time to learn more or help others. |  |  |

**Outcomes:**The student will:

* **1. identify how control systems are used in residential and commercial applications**
  + **1.1** draw and explain a process control system using block diagrams depicting each functional component and the flow of signals through the systems
* **2. identify basic process control systems and explain how they function**
  + **2.1** explain the difference between open-loop and closed-loop control systems
* **3. construct basic process control circuits, using passive devices**
  + **3.1** construct a basic process control system using passive devices including:
    - **3.1.1** thermistor
    - **3.1.2** pressure sensor
    - **3.1.3** proximity switch
    - **3.1.4** light control resist
    - **3.1.5** float switch
    - **3.1.6** reed switch
    - **3.1.7** photocell
  + **3.2** explain process control terms including:
    - **3.2.1** precision
    - **3.2.2** standard
    - **3.2.3** calibration
    - **3.2.4** accuracy
    - **3.2.5** sensor
    - **3.2.6** transducers
    - **3.2.7** distortion
    - **3.2.8** transients
    - **3.2.9** sampling
    - **3.2.10** interrupt
    - **3.2.11** frequency
  + **3.3** demonstrate knowledge in measuring voltage, current and resistance in any control system using analog and digital instruments
  + **3.4** explain how to test process control circuit(s), voltage, current, continuity, opens and shorts
* **4. demonstrate established laboratory procedures and safe work practices**
  + **4.1** demonstrate safe and correct procedures in measuring voltage, current and resistance using digital and analog meters
* **5. demonstrate basic competencies**
  + **5.1** demonstrate fundamental skills to:
    - **5.1.1** communicate
    - **5.1.2** manage information
    - **5.1.3** use numbers
    - **5.1.4** think and solve problems
  + **5.2** demonstrate personal management skills to:
    - **5.2.1** demonstrate positive attitudes and behaviours
    - **5.2.2** be responsible
    - **5.2.3** be adaptable
    - **5.2.4** learn continuously
    - **5.2.5** work safely
  + **5.3** demonstrate teamwork skills to:
    - **5.3.1** work with others
    - **5.3.2** participate in projects and tasks
* **6. make personal connections to the cluster content and processes to inform possible pathway choices**
  + **6.1** complete/update a personal inventory; e.g., interests, values, beliefs, resources, prior learning and experiences
  + **6.2** create a connection between a personal inventory and occupational choices