Course Syllabus

Salt Lake Technical College

Department of Electronics Technologies

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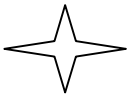

Prefix/Number: TEAM 1610 **Course Title:** Electric Motor Control Systems

Course Description:
This course teaches control of three-phase AC electric motors found in industrial applications, starting, reversing, jogging, and motor principles. Coverage of motor selection, diagrams, motor control devices, operation, installation, and troubleshooting. This course includes motor starter circuits, contactors, reduced voltage starting techniques, relays, braking, and variable frequency AC drives.

Credits: 4 **Course Hours:** 120 Clock-hours

Recommended requisites: Completion of TEAM 1050 & TEAM 1060

Semester(s) Taught: All

Available Class Schedules: Westpointe Center

Mon-Thu 7:00 a.m. - 1:00 p.m.
Mon-Thu 3:00 p.m. - 9:00 p.m.

Objectives:

- Explain requirements for electrical safety in the workplace, protection against electric shock, grounding, and lockout procedures.
- Interpret electrical drawings including various symbols, abbreviations, ladder diagrams, wiring-single line- block diagrams, motor terminal connections, motor nameplate, and terminology.
- Identify motor transformers and distribution systems, power distribution systems, transformer principles, and transformer connections.
- Use various motor control devices including manually operated switches, mechanically operated switches, sensors, and actuators.
- Explain the use and operation of electric motors including motor principles, direct current motors, three-phase alternating current motors, single-phase alternating current motors, alternating current motor drives, motor selection, motor installation, motor maintenance and troubleshooting.
- Connect and operate various contactors and motor starters including magnetic contactors, considering contactor ratings, enclosures, and solid-state types.
- Install various types of relays including electromechanical control relays, solid-state relays, timing relays, latching relays, and relay control logic.
- Connect and operate motor control circuits including motor starting, motor reversing, jogging, motor stopping, and motor speed control devices.
- Follow industry guidelines such as National Electrical Code (NEC) for motor installation.
- Define motor torque and horsepower.
- Explain the operation of variable frequency AC drives and applications in industrial processes.
- Test a control transformer.
- Connect and operate a basic electric control circuit using common Input/output devices.
- Connect and operate basic timer control circuits.
- Troubleshoot motor control systems.

Canvas Course Content Modifications:

The Electronics department reserves the rights to make minor changes that will remove errors, improve delivery, ensure accuracy, and support student learning outcomes. This effects mainly new courses as they go thru a debug process during the first year.

- Quiz questions
- Assessment requirements
- Learning resources
- Lab Projects

As these changes may occur at any time and point in course modules, the understanding is as such: A student will not be required to backtrack to complete any changed page, assignment, or assessment. A student will be required to complete any changed page, assignment, or assessment. Students are also required to follow instructions and complete work in the sequence of Modules, etc. Modules 1, Modules 2, etc.

***Course Outline*:** Specific course outlines are listed on the Canvas Course site and /or in the student learning plans.

***Department Course Outcomes Assessments/Examinations*:** Each course will have specific assessments listed, from module quizzes to department final theory examinations and hands-on demonstrations. Most tests are computer based and are delivered and graded by some type of LMS type software, which is usually part of the learning systems as well.

Assignments: All assignments are clearly listed and are usually part of a Module, which is addressing a particular competency. The Course Canvas site will list all assignment specifics.

Participation: You should consider this time of your life a very valuable opportunity in learning about Electronics, and the skills to enter a new or better occupation. Your involvement in the classroom and campus should be something that results in a lasting positive experience. "Get involved", utilize the resources, pick the instructors brains, and learn as much as you can.

Grading System:

The list below explains how letter grades will be defined for the course work required and completed. Each course will have specific requirements as listed in the canvas course site.

Letter Grades Scale:
The SLTC Electronics Department has as a minimum grade requirement of: C+ (77%) as a passing grade for all courses and all course assignments and assessments**.**

Letter Grade	Percentage	GPA
A+	97–100%	4.0
A	93–96%	3.9
A–	90–92%	3.7
B+	87–89%	3.3
B	83–86%	3.0
B–	80–82%	2.7
C+	77–79%	2.3
C	73–76%	2.0
C–	70–72%	1.7
D+	67–69%	1.3
D	63–66%	1.0
D–	60–62%	0.7
F	0–59%	0.0

Grades for SLTC Electronics Department are based on the assignment/assessments categories.

In most courses there are all 4 categories, and the letter grade will be based upon the average of the applicable categories. There are courses that do not have 4 categories and those exceptions are below.

4 - Categories

Category	Items	Weight	Criteria
Formative Assessment Cognitive	Theory/Quizzes	25%	100% of course work @ minimum grade of 77% for each assignment.
Formative Assessment Performance-Based	Skills Based Hands-on	25%	100% of course work @ minimum grade of 77% for each assignment.
Summative Assessment Cognitive	Theory/Quizzes/Exams	25%	100% of course work @ minimum grade of 77% for each assignment.
Summative Assessment Performance-Based	Skills Based Hands-on	25%	100% of course work @ minimum grade of 77% for each assignment.
		100%	

Any 3 - Categories Courses - Where there are only a SAC or SAP - but not both. Or not a FAC and/or FAP.

	Items	Weight	Criteria
Formative Assessment Cognitive	Theory/Quizzes	33.33%	100% of course work @ minimum grade of 77% for each assignment.
Formative Assessment Performance-Based	Skills Based Hands-on	33.33%	100% of course work @ minimum grade of 77% for each assignment.
Summative Assessment Cognitive or Summative Assessment Performance-Based	Theory/Quizzes/Exams Skills Based Hands-on	33.34%	100% of course work @ minimum grade of 77% for each assignment.
		100%	

2 - Categories assessments/assignments each will carry 50% of total weight for a total of 100%.

Formative Assessment – During the Learning Cycle

- Formative assessment is a term for any type of assessment or assignment used to gather student feedback and improve instruction. Formative assessments occur during the learning process, often while students are engaged in other activities. Anecdotal records, periodic quizzes or essays, diagnostic tests and in-class or

homework assignments are all types of formative assessment because they provide information about a student's progress. Any Formative Assessment serves in most cases as the determining tool that "says" you as a student are ready and able to "Demonstrate Proficiency" of the required course outcomes/objectives.

Therefore, any weakness or missed objectives that need addressing during the Formative cycle will require some level of remediation before any Summative Assessments are allowed.

You are encouraged to ask for assistance with concepts that are challenging.

Summative Assessment – Demonstration of Proficiency

- Summative assessment occurs at various points in a course and may include both cognitive and performance-based assessments.
- This is a time that you as a student should be able to complete the assignments and meet the criteria listed for the assessment.
- Objectives must be performed to the level that would meet industry requirements.

The department takes pride in our programs, and its mission is to fully support you in your endeavor to acquire skills to enter the fascinating field of Electronics Technologies. Please do not hesitate to approach the department with any questions at any time! When issues arise, please always follow the process of addressing it with the main faculty or staff that assist you on a regular basis, if you feel the problem or issue still exists, and there is no satisfactory solution; then approach the Full-time faculty and/or the department coordinator.

***Academic Progress*:**
Every effort has been made to ensure that the coursework for a course can be completed within 100% of the published hours. As a student you will be provided a copy of you course expectation dues dates and course completion points. This is to ensure that the "Student", is proficient and acquires the required "Skills-Set".
Homework: As a student you should expect to plan on about at least the course hours as out-side learning time. So, a 120- hour course may require 120 hours of homework.

Cheating: Plagiarism & Academic Dishonesty: *Plagiarism is stealing or passing off as one's own, ideas or words of another, whether or not copyrighted. Plagiarism will be penalized by the instructor according to the degree of dishonesty the instructor judges is involved. Students guilty of academic dishonesty are subject to disciplinary action. Disciplinary action may include but is not limited to reduction of a grade on an assignment or examination, reduction of a grade for the class, suspension or expulsion from the course and or program. Students may appeal disciplinary action taken against them by filing a grievance.

NOTE: It is YOUR responsibility to keep a copy of ALL your work. Also, keep a backup copy of any course work completed on a computer. Will not be responsible for any loss of materials, you have a student drive that you can use when you log-on to the PC's.

Allowed materials at the Assessment System is clearly listed, no notes or references, except those listed in the Canvas course site.

Students with Disabilities

Students with medical, psychological, learning, or other disabilities desiring accommodations or services under ADA, should contact the Disability Resource Center (DRC). The DRC determines eligibility for and authorizes the provision of these accommodations and services for the college.

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Emergency Evacuation

The building must be evacuated if the fire alarm sounds or if you are instructed to evacuate by an authorized Public Safety, Facilities, or administrative representative. Students in our class exit to nearest exit and move 20 feet away from the building. The instructor/lab aide will be happy to help you evacuate if you need assistance. Never ignore the fire alarm. Do not re-enter the building until directed to do so by an authorized Public Safety, Facilities, or administrative representative**.**