SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	Electronic Circuits II		
CODE NO. :	ELN213	**SEMESTER:**	THREE
PROGRAM:	Electrical Engineering Technician - Process Automation - Process Automation and Trades		
AUTHOR:	Edward Sowka		
DATE:	September 2012	**PREVIOUS OUTLINE DATED:**	September 2011
APPROVED:	*"Corey Meunier"* **CHAIR**		**DATE**
TOTAL CREDITS:	FOUR		
PREREQUISITE(S):	ELN109 and ELR109		
HOURS/WEEK:	FOUR		

For additional information, please contact Corey Meunier, Chair
Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

This course will introduce several electronic devices and circuits used in industry, with concentration on the Thyristor family of devices. The student will study the devices, their electrical characteristics, and typical industrial applications. Emphasis is placed on the analysis and troubleshooting of circuits, as well as some simplified design. This course prepares the students for analyzing and troubleshooting circuits and systems in the AC and DC Power Control industrial environment.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Understand the operation, characteristics, testing and application of industrial based devices and circuits.

Potential Elements of the Performance:

- Understand the operation of Industrial OPAMP circuits and systems including (but not limited to) Comparators, Schmitt Triggers, Integrators and Differentiators.
- Determine and calculate the output characteristics employing OPAMPS.
- Understand and calculate typical Timing Circuits including (but not limited to) Linear Capacitor Charging and Astable and Monostable Integrated Timer Circuits
- Understand the operation of various semiconductor and thyristor devices including (but not limited to) SCR's, DIAC's TRIAC's, UJT's, PUT's as well as other common 4-Layer devices.
- Analyze and solve circuits in AC and DC Power control systems (Single Phase).
- Correctly select / replace devices in applications based on operational requirements and characteristics.
- Perform In / Out of circuit testing to determine component functionality.

2. Analyze, test and troubleshoot electronic circuits.

Potential Elements of the Performance:

- Accurately analyze the operation of typical industrial circuits employing typical electronic devices outlined.
- Perform simple AC and/or DC calculations of common circuits to determine the operation / functionality.
- Correctly test circuits for functionality, using common and specialized test equipment.

- Correctly and accurately troubleshoot malfunctioning circuits.

3. Design and modify simple industrial circuits.

Potential Elements of the Performance:

- Design simple industrial control circuits employing common devices outlined.
- Correctly modify existing circuits for changing operating characteristics and conditions.

III. TOPICS:

1. Operational amplifier industrial applications.
2. Timing circuits.
3. UJT / PUT characteristics and applications
4. SCR / TRIAC characteristics and applications

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- 2nd Year Electronics 2 Parts Package (Purchased from Electrical Club)
- 1st year parts package
- 1st year Electronics Text book
- Course notes
- Access to Internet for Component Data Sheets

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade will be a combination of theory and practical tests.

45% = Theory (Consisting of 2 tests and several quizzes)
50% = Lab Activities (Lab Reports and Practical Tests)
5% = 1st Year Review Test

NOTE: You must obtain a minimum mark of 50% individually in the Theory and Lab in order to pass. Obtaining an individual mark less than 50% in either the Theory or Lab marks will result in an overall "F" Grade.

See Special Notes Section VI for further details affecting final grade.

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 - 100%	4.00
A	80 - 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	Below 50%	0.00
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed and the professor has started the lesson, the learning process has begun. Late arrivers will not be granted admission to the room. Refer to Student Rights and Responsibilities documentation for sanctions.

Additional Criteria:

- ***Attendance*** to lab activities is compulsory, unless discussed with the instructor in advance of the absence and the absence is for a medical or family emergency. A ***deduction of 2% per missed Lab*** will be imposed on the final lab mark. Your attendance to all classes and your final grade are directly related and as such, it is strongly recommended to attend all scheduled Theory Classes / Tutorials. Theory and Lab tests/quizzes will be based not only on what is contained in the textbook and handouts, but also what is being discussed / described in the classroom.

- ***Laboratory Reports*** shall be subject to the handout and criteria as outlined at the start of the semester by the Professor, and is subject to change. All Lab Reports are due ***before*** the start of the following weeks Scheduled Lab Class (or alternate indicated deadline) unless otherwise stipulated by the instructor. A ***deduction of 20%*** will be assessed for late submissions within the first 24 hour period following the deadline. Reports submitted after 24 hours of the specified deadline will be graded as 0% (Weekends included in all deadline requirements).

- ***Lab Reports*** are graded based on the following:
    1. Ability to follow instructions
    2. Ability to follow specific technical procedures
    3. Ability to use test equipment to obtain data
    4. Accuracy of data
    5. Ability to use required software
    6. Ability to adhere to established deadlines
    7. Ability to draw conclusions based on objectives
    8. Ability to produce a technical report as specified

- **All Lab Reports must be submitted in a Duo-Tang cover (No Binders) unless otherwise noted. Reports not in a Duo-Tang will not be accepted and as such will be graded 0%.**

- Submitted lab reports are not to contain any part of the original lab handout, unless otherwise stated in the handout, or by the professor.

- ***Incomplete submissions*** will be returned to the student and will not be graded until such a time as they are completed. The maximum mark that can be obtained for incomplete labs re-submitted will be 50%. Incomplete reports must be re-submitted within 5 calendar days of receiving the incomplete grade. Incomplete reports re-submitted after that, will be graded 0%. **All Labs and Lab Reports must be complete and submitted to obtain an overall passing grade. Failing to complete and submit all labs/lab reports will result in a final grade of "F" regardless of all other marks obtained.**

- Any student that is absent for any test (for a legitimate emergency) will be required to provide a doctors' note immediately upon returning. Failing to do so will result in a grade of 0% being assigned to the missed test. It is the students' responsibility to contact the college and/or Professor if he/she will be absent for any classes. Test dates will be provided to the students, a minimum of 2 weeks in advance of the test.

- Tests, quizzes and other activities will not be scheduled on an individual basis, unless it is for a medical or family emergency.

- Quizzes can and will be given without notice, and are designed to determine whether or not the student has been performing the requirements up to that point in time or for the specific theory/concept being taught (homework/assignments etc.). Missed quizzes will be assigned a mark of 0%.

- Disruptions to theory classes, such as lateness, are not acceptable and will be dealt with on an individual basis. Students exhibiting chronic lateness, disruptiveness or absenteeism will be required to meet with the department Chairperson, and will be placed on academic probation. Refer to Student rights and Responsibilities for additional sanctions.

- The use of Cell Phones during scheduled classes is prohibited. Turn off all Cell Phones prior to attending class. Anyone found using a cell phone during class, will have the phone confiscated and returned only after the end of the scheduled class. If you are expecting an important/emergency call, you must inform the instructor prior to the start of the class, and the phone must be in silent/vibrate mode only. Multiple infractions will result in sanctions.

Theory Tests will not be returned.
Students will be given the opportunity to review / correct the test material.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.