Department:	ENERGY TECHNOLOGY
Course Title:	INDUSTRIAL ELECTRONICS
Section Name:	ELMT 2433
Semester:	FALL 2015
Time:	TBA
Classroom:	ET 200
Instructor:	TOM CRONICK
Email:	tcronick@odessa.edu
Office:	ET 200
Office Phone:	335-6309
Office Hours:	AS POSTED

Course Description:

Devices, circuits, and systems primarily used in automated manufacturing and/or process control including computer controls and interfacing between mechanical, electrical, electronic, and computer equipment. Includes presentation of programming schemes. (SCANS 3,5,8,9)

Required Texts:

Equipment Requirements:

Description of Institutional Core Objectives (ICO's)

Given the rapid evolution of necessary knowledge and skills and the need to take into account global, national, state, and local cultures, the core curriculum must ensure that students will develop the essential knowledge and skills they need to be successful in college, in a career, in their communities, and in life. Therefore, with the assistance of the Undergraduate Education Advisory Committee, the Coordinating Board has approved guidelines for a core curriculum for all undergraduate students in Texas.

Through the application and assessment of objectives within the institution's core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning. Appropriate Odessa College faculty periodically evaluates all of the courses listed in the descriptions on the following pages of this catalog and keys them to Odessa College's Institutional Core Objectives (ICOs), as defined by the Texas Higher Education Coordinating Board (THECB). (Source: *Odessa College Catalog of Courses 2012-2013, page 73)*

Odessa College's Institutional Core Objectives (ICOs):

1) *Critical Thinking Skills* - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

2) *Communication Skills* - to include effective development, interpretation and expression of ideas through written, oral and visual communication
3) *Empirical and Quantitative Skills* - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
4) *Teamwork* - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
5) *Personal Responsibility* - to include the ability to connect choices, actions and consequences to ethical decision-making
6) *Social Responsibility* - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

Learning Outcomes for ELMT 2433 (Source: *Odessa College Catalog of Courses*)

Outcome	ICO
CIRCUIT ANALYSIS	*Critical Thinking Skills* - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
LAB PARTNERS	*Communication Skills* - to include effective development, interpretation and expression of ideas through written, oral and visual communication
OHMS LAW	*Empirical and Quantitative Skills* - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
LAB PARTNERS	*Teamwork* - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
	Personal Responsibility - to include the ability to connect choices, actions and consequences to ethical decision-making
	Social Responsibility - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

Odessa College Policies

Academic Policies
Note that the OC Student Handbook states (page 32) that "[i]n cases of academic dishonesty, the instructor has the authority to impose appropriate scholastic penalties. Complaints or appeals of disciplinary sanctions may be filed in accordance with the college due process procedure. Copies of the college due process procedure are available in the office of The Director of Student Life (CC104)."
For more information on your rights and responsibilities as a student at Odessa College, please refer to the following: *The 411 of OC: Student Handbook 2012-2013; Student Rights & Responsibilities*
http://www.odessa.edu/dept/studenthandbook/handbook.pdf

Scholastic Dishonesty
Scholastic dishonesty shall constitute a violation of these rules and regulations and is punishable as prescribed by board policies. Scholastic dishonesty shall include, but not be limited to, cheating on a test, plagiarism and collusion.

> **"Cheating on a test" shall include:**
> - Copying from another student's test paper
> - Using test materials not authorized by the person administering the test.
> - Collaborating with or seeking aid from another student during a test without permission from the test administrator.
> - Knowingly using, buying, selling, stealing or soliciting, in whole or in part, the contents of an unadministered test.
> - The unauthorized transporting or removal, in whole or in part, of the contents of the unadministered test.
> - Substituting for another student, or permitting another student to substitute for one's self, to take a test.
> - Bribing another person to obtain an unadministered test or information about an unadministered test.
> - "Plagiarism" shall be defined as the appropriating, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own written work.
> - "Collusion" shall be defined as the unauthorized collaboration with another person in preparing written work for fulfillment of course requirements. (Source: *Odessa College Student Handbook 2012-2013, page 29-30*)

Special Populations/Disability Services/Learning Assistance
Odessa College complies with Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. If you have any special needs or issues pertaining to your access to and participation in this or any other class at Odessa College, please feel free to contact me to discuss your concerns. You may also call the Office of Disability services at 432-335-6861 to request assistance and accommodations.

Odessa College affirms that it will provide access to programs, services and activities to qualified individuals with known disabilities as required by **Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990 (ADA)**, unless doing so poses an undue hardship or fundamentally alters the nature of the program or activity Disabilities may include hearing, mobility or visual impairments as well as hidden disabilities such as chronic medical conditions (arthritis, cancer, diabetes, heart disease, kidney disorders, lupus, seizure disorders, etc.), learning disabilities or psychiatric or emotional disabilities. A student who comes to Odessa College with diagnosed disabilities which may interfere with learning may receive

accommodations when the student requests them and submits proper documentation of the diagnosis. A Request for Accommodations form and guidelines for beginning the request process are available in the OC Help Center or on the Odessa College web site at www.odessa.edu/dept/counseling/disabilities.htm. The college strives to provide a complete and appropriate range of services for students with disabilities such as assistance with testing, registration, information on adaptive and assistive equipment, tutoring, assistance with access and accommodations for the classroom where appropriate. For information regarding services, students with disabilities should contact the Office of Disability Services in the OC Help Center located in Room 204 of the Student Union Building or call 432-335-6433. (Source: *Odessa College Catalog of Courses 2012-2013, page 52)*

Dropping a Course or Withdrawing from College
Students wishing to drop a non-developmental course may do so online using WebAdvisor, at the Wrangler Express, or Registrar's Office. A student wishing to drop a developmental course or withdraw from college should obtain a drop or withdrawal form from the Wrangler Express or the Registrar's Office. Students are encouraged to consult with instructors prior to dropping a class. Students may not completely withdraw from the college by use of the Web. Students must drop a class or withdraw from college before the official withdrawal date stated in the class schedule. Students who are part of the Armed Forces Reserves may withdraw with a full refund if the withdrawal is due to their being ordered into active duty. A copy of the student's orders must be presented to the Registrar's Office at the time of the withdrawal. For details, please contact the Office of the Registrar. **No longer attending class does not automatically constitute withdrawal from that class, nor does a student's notification to an instructor that the student wishes to be dropped. Failure of a student to complete the drop/withdrawal process will result in a grade of "F."** (Source: *Odessa College Catalog of Courses 2012-2013, page 36)*

MURRY H. FLY LIBRARY

Main Number	432-335-6640
Email	library@odessa.edu
Campus Location	1st floor of the Learning Resources Center (LRC)
Website with Additional Help and Information	http://www.odessa.edu/dept/library Ask A Librarian: https://www.odessa.edu/dept/library/askalibrarian.htm

Equipment and Services Provided:

The Murry H. Fly Library, located in the Learning Resources Center, is a full-service academic library whose mission is to provide research and other educational resources to the Odessa College community.

Super Search, the library's centralized search engine, offers easy access locating materials in the library's collection. The following resources are available through the library.

- **Books, Videos, CDs** – 30,000+ books and 4,000+ media holdings

- **Ebooks** – 50,000+
- **Specialized databases** for current students – 60+
    - *Remote access requires OC login
- **Magazines, newspapers, & scholarly journals**
- **Interlibrary loan services** of material from participating Texas libraries
- **Online Tutorials**
    - *Tips for research strategies
- **Computers for online research, homework, and printing**
- **Selected textbooks** for short-term use in the library only
- **Photocopier and FAX service** – There is a charge associated with these services
- **VHS/DVDs –** in library use only
- **Quiet study rooms** for individual and group study
    - *Must check in at the main desk
- **Larger meeting rooms** – for events, educational workshops, and group computer use. Reservations required

TUTORING SERVICES

Odessa College provides tutoring services to assist students in meeting their academic and career goals. The College strives to provide new and updated resources and services at no charge to OC students. Computers provide Internet access, Microsoft Office, and software resources to assist OC students in improving their reading, writing, and mathematical skills.

Appointments are preferred, but walk-ins are accepted as availability allows. Tutoring services are offered in a number of locations on and off campus. For more information or to make an appointment:

- **Student Success Center**, located in the Learning Resources Center, provides support for a variety of academic subjects as well as TSI test prep, AVID, study skills training, workshops, assistance with Blackboard, student email, OC portal, student orientation tours, and more.

Main Number	432-335-6878
Email	studentsuccesscenter@odessa.edu
Campus Location	1st floor of the Learning Resources Center (LRC)
Website with Additional Help and Information	http://www.odessa.edu/dept/ssc/
Live Online Chat Assistance	Click Here Subject to availability. *(If no one is currently available, call or email)*

- **Math Lab**, located on the second floor of the Wood Math and Science building, provides support for all math-related tutoring

Math Lab Main Number	432-335-6537
Email	mymathlab@odessa.edu

Campus Location	Wood Math and Science building, Room 201
Website with Additional Help and Information	http://www.odessa.edu/dept/ssc/math_lab.htm Provides support for all math related tutoring

- **Synapse Lab**, located on the third floor of the Wood Math and Science building, provides support for all science-related tutoring

Synapse Lab Main Number	Coming soon
Email	SynapseLab@odessa.edu
Campus Location	Wood Math and Science building, Room 308
Website with Additional Help and Information	http://www.odessa.edu/dept/biology/tutoring.htm Provides support for all science related tutoring

- **Writing Center**, located on the first floor of Wilkerson Hall, provides support for all writing-related tutoring

Writing Center Main Number	Coming soon
Email	writingcenter@odessa.edu
Campus Location	Wilkerson Hall, 106
Website with Additional Help and Information	Coming soon Provides support for writing related tutoring

- **Offsite tutoring services** are available in the Rodeo and Agriculture Graham Center located in Gardendale

- **Online tutoring** is available 24/7 through Upswing, which will start Fall II, a web-based, student-friendly service

Student E-mail
Please access your Odessa College Student E-mail, by following the link to either set up or update your account: http://www.odessa.edu/gmail/. **Correspondence will be submitted using your Odessa College email as an alternative method to contact you with information regarding this course.**

Technical Support
For Blackboard username and password help and for help accessing your online course availability and student email account contact the Student Success Center at 432-335-6878 or online at https://www.odessa.edu/dept/ssc/helpdesk_form.htm.

Expectations for Engagement – Face to Face Learning
To help make the learning experience fulfilling and rewarding, the following Expectations for Engagement provide the parameters for reasonable engagement between students and instructors for the learning environment. Students and instructors are welcome to exceed these requirements.

Reasonable Expectations of Engagement for Instructors

1. As an instructor, I understand the importance of clear, timely communication with my students. In order to maintain sufficient communication, I will

- provided my contact information at the beginning of the syllabus;
- respond to all messages in a timely manner through telephone, email, or next classroom contact; and,
- notify students of any extended times that I will be unavailable and provide them with alternative contact information (for me or for my supervisor) in case of emergencies during the time I'm unavailable.

2. As an instructor, I understand that my students will work to the best of their abilities to fulfill the course requirements. In order to help them in this area, I will

- provide clear information about grading policies and assignment requirements in the course syllabus, and
- communicate any changes to assignments and/or to the course calendar to students as quickly as possible.

3. As an instructor, I understand that I need to provide regular, timely feedback to students about their performance in the course. To keep students informed about their progress, I will

- return classroom activities and homework within one week of the due date and
- provide grades for major assignments within 2 weeks of the due date or at least 3 days before the next major assignment is due, whichever comes first.

Reasonable Expectations of Engagement for Students

1. As a student, I understand that I am responsible for keeping up with the course. To help with this, I will

- attend the course regularly and line up alternative transportation in case my primary means of transportation is unavailable;
- recognize that the college provides free wi-fi, computer labs, and library resources during regular campus hours to help me with completing my assignments; and,
- understand that my instructor does not have to accept my technical issues as a legitimate reason for late or missing work if my personal computer equipment or internet service is unreliable.

2. As a student, I understand that it is my responsibility to communicate quickly with the instructor any issue or emergency that will impact my involvement with or performance in the class. This includes, but is not limited to,

- missing class when a major test is planned or a major assignment is due;
- having trouble submitting assignments;
- dealing with a traumatic personal event; and,
- having my work or childcare schedule changed so that my classroom attendance is affected.

3. As a student, I understand that it is my responsibility to understand course material and requirements and to keep up with the course calendar. While my instructor is available for help and clarification, I will

- seek out help from my instructor and/or from tutors;
- ask questions if I don't understand; and,
- attend class regularly to keep up with assignments and announcements.

As part of the Design for Completion initiative, your Odessa College Student Success Coach and faculty mentor will help you stay focused and on track to complete your educational goals. If an instructor sees that you might need additional help or success coaching, he or she may submit a Retention Alert. Your Student Success Coach or faculty mentor will contact you toward a solution.

Course Policies

Disclaimer
This syllabus is tentative and subject to change in any part at the discretion of the instructor. Any changes will be in accordance with Odessa College policies. Students will be notified of changes, if any, in timely manner.

Original Effort
The work submitted for this course must be original work prepared by the student enrolled in this course. Efforts will be recognized and graded in terms of individual participation and in terms of ability to collaborate with other students in this course.

Description of students

Students enrolled in this course _____

Course prerequisites

NONE (Source: *Odessa College Catalog of Courses 2012-2013, page 178)*

Course Alignment with Industry Standards

Digital Protocol
Cell phones must be placed on either *vibrate* or *silent* mode and are to be accessed in emergency cases only. The use of laptops or any other digital device is permitted in order to facilitate note-taking relative to instruction. Any written assignments will be submitted electronically on Blackboard. **The electronic recording of the time on Blackboard will be considered the time of assignment submission. Take necessary steps to ensure that your assignments are submitted on "Blackboard" time.** Back-up and/or additional copies of all assignments submitted is encouraged. **Computers/printers are available to OC students in the LRC (301-303); therefore, not having access to a computer due to technical issues (crash; corrupted files) will not be considered as an acceptable reason for not completing assignments.** If there is a loss of server connection with Odessa College due to maintenance, then an email will be sent to student with pertinent information and status reports. Assignments submitted electronically need to be **WORD documents (doc or docx).**

Attendance Policy
Students are expected to attend class regularly. Attendance will be recorded using a "sign-in" sheet. Excessive absences will be grounds for disciplinary action, and will be determined on a case-by-case basis. If you are more than 15 minutes late to class or leave class early without notifying the instructor, this will count as an absence. Students are permitted 0 (zero) absences before a loss of 0 (zero) point(s).

AVID

This course has been identified as a course by Career, Technical, and Workforce Education as one in which teaching and learning strategies adopted by AVID will be implemented. As a student in the legal program, you will be expected to develop an understanding of the strategies, to model the strategies, to maintain fidelity of implementation, and to examine how these strategies may impact your effectiveness as a professional in your chosen area of occupation, either through coursework or practicum experience as outlined by the course instructor.

Grading Policy

Please understand that this is a required course for the "ELECTRONICS\INSTRUMENTATION" program in order to prepare you for a technical career. Quality work and active participation is expected and not to be negotiated. As a general policy, grades will be taken in class. Any written assignments or tests will be graded outside of class. You can expect feedback on assignments within a week's time.

Grade Inquiry Policy

It is the responsibility of the individual taking this course to maintain accurate track of assignment submissions and grades. There will be opportunities during the semester to meet with the instructor to discuss your academic progress. Contact the instructor to schedule an appointment. Class time will not be used for grade inquiries. All grades are final**.**

Communication Plan

The best way to communicate with the course instructor is via email through Blackboard. Also, check in Blackboard regularly for announcements, including any changes in the course schedule due to instructor illness or conference attendance. Appointments with the instructor may also be scheduled.

General Course Requirements
1. Attend class and participate.
2. Contribute and cooperate with civility.

Submit assignments on time. Late work will not be accepted. Medical and/or family circumstances that warrant an extension on assignments need to be presented to the instructor. Extensions will be allowed at the instructor's discretion.

Equipment Requirements: Calculator, Digital Meter

Grading Scale:
"A" = 90-100
"B" = 80-89
"C" = 70-79
"D" = 65-69
"F" = 0-64

Incomplete Policy

An 'Incomplete' grade may be given only if:

1. The student has passed all completed work
2. If he/she has completed a minimum of 75% of the required coursework. A grade of an "I" will only be assigned when the conditions for completions have been discussed and agreed upon by the instructor and the student.

Overview of assignments

Type of Assignment	Percentage
1. LAB ASSIGNMENTS	25%
2. TESTS	25%
3. FINAL TEST	25%
4. PROFESSIONALISM	25%
TOTAL	100%

INDUSTRIAL ELECTRONICS

LESSON #	GENERAL TOPIC	SPECIFIC TOPIC	LAB\TASK\INFO
1	Intro Syllabus Review Breadboard Basics	✓ Digital Overview ✓ Breadboard ✓ LED's	➢ LAB 1.1 ➢ Breadboard,LED's
2	Digital Electronics	✓ Overview ✓ Number Systems ✓ Integrated Circuits ✓ Logic Families ✓ Pin Identification ✓ Power and Speed	➢ LAB 2.1 ➢ Breadboard ➢ Digital Logic ➢ Logic Probes ➢ Insertion\Extraction Tools
3	Design Techniques Logic Gates	✓ Definitions ✓ AND/OR GATES ✓ INVERT Function ✓ Clocks	➢ LAB 3.1 ➢ Gating devices ➢ Logic ➢ Clocks
4	Design Techniques Logic Gates	✓ Gates ✓ Design Techniques	➢ LAB 4.1 ➢ Gate Design ➢ Game Show

5	Digital Clocks	✓ Clocks ✓ Edge Devices	➢ LAB 5.1 ➢ Flip Flop Basics
6	Edge Sensitive Devices	✓ Edge Devices ✓ Binary Counting	➢ LAB 6.1 ➢ Binary Code
7	Counters	✓ Binary Coded Decimals	➢ LAB 7.1 ➢ Counters using 74191
8	Displays	✓ Diodes ✓ 7 Segment Displays	➢ LAB 8.1 ➢ 7 Segment Displays
TEST			
9	Display Drivers	✓ 7 Segment Displays ✓ Decoder Drivers	➢ LAB 9.1 ➢ 7447 Decoder Driver
10	Displays	✓ Hex Displays ✓ Counters	➢ LAB 10.1 ➢ Hex Display (TIL 311) ➢ Set\Reset\Clear
11	Counters	✓ Design Techniques	➢ LAB 11.1 ➢ Design techniques with Set\Reset\Clear
TEST			
12	Clock\Timer	✓ Square Wave Generator ✓ 555 Chip	➢ LAB 12.1 ➢ 555 Chip ➢ Design techniques
13	Shift Registers	✓ Basis Shift Operation	➢ Lab 13.1 ➢ 74164 Chip
14	Shift Registers	✓ Input\Output Operations	➢ Lab 14.1 ➢ Baseball Scoreboard
15	Shift Registers	✓ Serial\Parallel	➢ Lab 15.1 ➢ Serial Input\Parallel Output
16	Shift Registers	✓ Parallel	➢ Lab 16.1 ➢ Parallel Loading
17	Shift Registers	✓ Data Transfer	➢ Lab 17.1 ➢ Data Transfer
18	Data Selection	✓ Data Manipulation	➢ LAB 18.1 ➢ Data Selection ➢ 74151 ➢ Electronic Organ
19	Memory	✓ Data Memory	➢ LAB 19.1 ➢ Data Memory ➢ 7489
20	Random Information	✓ Random Digits	➢ LAB 20.1 ➢ RC Time delays ➢ 74192
21	Binary Arithmetic	✓ Addition	➢ LAB 21.1 ➢ Binary Addition ➢ 7483
22	Decoders	✓ Binary Decoding	➢ LAB 22.1 ➢ Decoding ➢ 7442

23	Analogue-to-Digital	✓ AtoD Conversion	➢ LAB 23.1 ➢ A to D conversion ➢ ADC0804
24	Microprocessors	✓ Microprocessor Basics	➢ LAB 24.1 ➢ uprocessor basics ➢ Motorola 68HC11
FINAL TEST				