Surigao City Campus

Bachelor of Science in Electrical Engineering

SURIGAO STATE COLLEGE OF TECHNOLOGY

SSCT

"For Nation's Greater Heights"

I.4.6. design of means of transportation using electricity;

COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY
City Campus
First Semester, Academic Year 2021-2022

Outcomes Based-Education (OBE) Syllabus in EE 311
Industrial Electronics
Course Credit: 4.0 units **(108 hrs.)**

Institutional Vision, Mission, and Goals

Vision:
An innovative and technologically-advanced State College in Caraga.

Mission:
To provide relevant,

a. high quality and sustainable instruction,
b. research, production and extension programs and
c. services within a culture of credible and responsive institutional governance.

Goals:

1. Foster application of the discipline and provide its learner with industry-based training and education particularly in engineering, technology and fisheries.
2. Conduct and utilize studies for the development of new products, systems and services relevant to Philippine life and of the global village.
3. Promote transfer of technology and spread useful technical skills, thus empowering its learners and their activities.

SSCT Core Values

Service-Oriented Socially Responsive Committed Transformational

SSCT Quality Policy

Surigao State College of Technology provides quality instruction, research, extension programs and production services to satisfy its customers by responding to their needs and expectations and continually improving its quality management system.

Institutional Graduate Attributes (IGA) :

- Visionary Leader
- Effective Communicator
- Competent Technologist
- Self-Directed Lifelong Learner

Program Goals

The Electrical Engineering program aims to design and apply the generation, transmission, and distribution of electrical energy to produce competent engineers that exhibit positive work ethics and flexibility in work conditions for the development of Caraga.

Program Educational Objectives (PEO) and Relationship to Institutional Mission

Program Educational Objectives (PEO)	Mission		
	a	b	c
EE-PEO1. Demonstrate professionalism in electrical engineering and apply professional ethics thru communication and collaboration.	/	/	/
EE-PEO2. Use appropriate techniques, resources, and modern tools necessary for analysis, design, and modeling of complex electrical systems	/	/	/
EE-PEO3. Plan, lead, and implement designated tasks, interact with other engineering professionals, and take leadership roles in electrical engineering organization.	/	/	/
EE-PEO4. Engage in lifelong learning able to discover new opportunities for continuing personal and professional development in electrical engineering	/	/	/

Program Outcomes (PO) and Relationship to Program Educational Objectives (PEO)

Program Outcomes (PO)	Program Educational Objectives (PEO)			
	1	2	3	4
EE-POa. Apply knowledge of mathematics and sciences to solve complex engineering problems				
EE-POb. Develop and conduct appropriate experimentation, analyze and interpret data	/	/	/	/
EE-POc. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical,				

health and safety, manufacturability, and sustainability, in accordance with standards				
EE-POd. Function effectively on multi-disciplinary and multi-cultural teams that establish goals, plan tasks, and meet deadlines				
EE-POe. Identify, formulate, and solve complex problems in electrical engineering				
EE-POf. Recognize ethical and professional responsibilities in engineering practice				
EE-POg. Communicate effectively with a range of audiences	/	/	/	/
EE-POh. Understand the impact of engineering solutions in a global, economic, environmental, and societal context				
EE-POi. Recognize the need for additional knowledge and engage in lifelong learning				
EE-POj. Articulate and discuss the latest developments in the field of electrical engineering				
EE-POk. Apply techniques, skills, and modern engineering tools necessary for electrical engineering practice				
EE-POl. Demonstrate knowledge and understanding of engineering and management principles as a member and/or leader in a team to manage projects in multidisciplinary environments				

Course Description

The course covers nodal and mesh analysis; application of network theorems in circuit analysis; analysis of circuits with controlled sources and ideal op-amps; fundamentals of capacitors and inductors; analysis of dc-driven RL, RC, and RLC circuits; sinusoidal steady-state analysis of general RLC circuits.

DACUM Main Duties (DMD)

EE-DMD1. Diagnose electrical problems using the electrical diagrams or blue print (as built electrical plans)
EE-DMD2. Install, repair, and maintenance electrical power systems (building wiring, controls, electrical machines and transformers)
EE-DMD3. Facilities Manager
EE-DMD4. Power Plant Manager
EE-DMD5. Electrical Researchers, Professor and Faculty

Course Outcomes (CO) and Relationship to Program Outcomes (PO)

Program Outcome (PO) / Level	Course Outcomes (CO)	Assessment Task (CO-AT)	DACUM Links				
			1	2	3	4	5
EE-POb. Develop and conduct appropriate experimentation, analyze and interpret data *Enabling* EE-POe. Identify, formulate, and solve complex problems in electrical engineering *Enabling* EE-POg. Communicate effectively with a range of audiences *Introductory*	EE 311- CO1: Identify various electronic power controls (EE-POb, EE-POe) EE 311- CO2: Describe how they are designed and their applications (EE-POb, EE-POg)	*CO-AT1:* Students conduct electronic experiments. These experiments serve as a group activity where they will analyze and interpret data. Criteria – Functionality and lab report Total Points: 100 points	/	/			/
		CO-AT2: Students calculate sets of electronic problems using the electronic circuit theory concepts. Criteria – 70% correct answers and solutions Total Points: 100 points		/	/		
		CO-AT3: Students create a group project and present them in the class. Criteria – creativity, functionality, delivery Total Points: 100 points	/	/	/	/	/

Course Outcomes (CO) and Relationship to Intended Learning Outcomes (ILO)

Course Outcomes (CO)	Intended Learning Outcomes (ILO)
EE 311- CO1: Identify various electronic power controls (EE-POb, EE-POe) EE 311- CO2: Describe how they are designed	EE 311 – ILO1: Identify the different types of filter circuits used in power supply. (EE 311-CO1)

and their applications (EE-POb, EE-POg)	EE 311 – ILO2: Determine the functions, operations and applications of a filtered power supply. (EE 311-CO1) EE 311 – ILO3: Develop skills in analyzing the current path in a power supply (EE 311-CO2) EE 311 – ILO4: Identify the different types of voltage multipliers. (EE 311-CO1) EE 311 – ILO5: Describe how each type operates and its characteristics (EE 311-CO2) EE 311 – ILO6: Identify different types of voltage regulators and determine its operations and applications (EE 311-CO1) EE 311 – ILO7: Identify the different types of polyphase rectifiers. (EE 311-CO1) EE 311 – ILO8: Explain and analyze the operation of a half-wave polyphase rectifier and full-wave polyphase rectifiers (EE 311-CO2) EE 311 – ILO9: Describe the characteristics and operations of a SCR, UJT, PUT, TRIAC's, DIAC's and other thyristors (EE 311-CO2) EE 311 – ILO10: Identify the different types of optoelectronics devices and Sensors (EE 311-CO1) EE 311 – ILO11: Identify the different types of transducers and its characteristics (EE 311-CO1) EE 311 – ILO12: Determine the types of input/output transducers and its applications. (EE 311-CO2)

	EE 311 – ILO13: Understand Pneumatics and Electro-pneumatics as the foundation of PLC and its importance in industry (EE 311-CO1) EE 311 – ILO14: Acquire skills in PLC ladder diagramming (EE 311-CO2) EE 311 – ILO15: Understand the concepts of Robot and its usefulness in automation (EE 311-CO1) EE 311 – ILO16: Identify the different mechanical configuration of industrial robots (EE 311-CO1) EE 311 – ILO17: Describe the operation of different types of industrial robots.(EE 311-CO2)

Detailed Course Content

Intended Learning Outcomes (ILO)	Topics	Time Frame	Teaching and Learning Activities (TLA)	Assessment Tasks (ILO-AT)	Target	Resources	Values Integration	Remarks
Express understanding of the Vision and Mission statements of SSCT, including its Goals and Objectives; Analyze the syllabus by looking into the ILOs,	**ORIENTATION ON THE COURSE** **VMGO**	1 hr.	*Readings* on SSCT Student Handbook Instructor will provide a course outline reflecting			SSCT Student Handbook Syllabus		

Subject Matter, TLAs, Assessment Strategies, Values and References; and Design strategies that will help meet the requirements and obtain desired grades/marks for the course	**Syllabus** **Grading System**		the VMGO, core values, IGA, program goals, course description, topics, course outcomes and requirements, grading system and course policies.			Criteria for the Grading System BOT Resolution No. 51, S. 2020	Core Value: *Service oriented* Sub-Value: *Diligent pursuit of VMGO*	
EE 311 – ILO1: Identify the different types of filter circuits used in power supply. (EE 311-CO1) EE 311 – ILO2: Determine the functions, operations and applications of a filtered power supply. (EE 311-CO1) EE 311 – ILO3: Develop skills in analyzing the current path in a power supply (EE 311-CO2)	1. **FILTERED POWER SUPPLY**	7hrs	Discussion via Google Meet *Synchronous* Learning Module 1 *Asynchronous*	Identification quiz on the types of filter cicuits	70% of the students shall have a rating of at least 3.0	Modules, e-books, textbooks, and worksheets	Core Value: *Committed* Sub-Value: *Determined in learning the different types of filter circuits*	
EE 311 – ILO4: Identify the different types of voltage multipliers. (EE 311-CO1) EE 311 – ILO5: Describe how each type operates and its	**2. VOLTAGE MULTIPLIERS**	4hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 2 *Asynchronous*	Oral report/presentation on voltage multipliers	70% of the students shall have a rating of at least 3.0	PowerPoint presentation on voltage multipliers and its characteristics	Core Value: *Committed* Sub-Value: *Determined in learning voltage multipliers*	

characteristics (EE 311-CO2)								
EE 311 – ILO6: Identify different types of voltage regulators and determine its operations and applications (EE 311-CO1)	**3. VOLTAGE REGULATORS**	4hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 3 *Asynchronous*	Oral report/presentation thru online in voltage regulators	70% of the students shall have a rating of at least 3.0	PowerPoint presentation in voltage regulators and its operations	Core Value: *Committed* Sub-Value: *Dedicated in voltage regulators*	
EE 311 – ILO7: Identify the different types of polyphase rectifiers. (EE 311-CO1) EE 311 – ILO8: Explain and analyze the operation of a half-wave polyphase rectifier and full-wave polyphase rectifiers (EE 311-CO2)	**4. POLYPHASE RECTIFIERS**	4hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 4 *Asynchronous*	Q & A in different types of rectifier and its operations	70% of the students shall have a rating of at least 3.0	Videos online, modules, e-books,	Core Value: *Transformational* Sub-Value: *Adaptive in learning and solving rectifiers*	
EE 311 – ILO9: Describe the characteristics and operations of a SCR, UJT, PUT, TRIAC's, DIAC's and other thyristors (EE 311-CO2)	**5.THYRISTORS AND OTHER CONTROL DEVICES**	4hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 4 *Asynchronous*	Oral report/presentation thru online on thyristors	70% of the students shall have a rating of at least 3.0	Videos online, modules, e-books,	Core Value: *Transformational* Sub-Value: *Adaptive in learning types of thyristors*	
MIDTERM EXAMINATION – 2.0 Hrs.								
EE 311 – ILO10: Identify the different types of optoelectronics	**6. OPTOELECTRONIC DEVICES AND SENSORS**	6hrs	Discussion via Google Meet and video viewing *Synchronous*	Oral report/presentation thru online on optoelectronic	70% of the students shall have a	Videos online, modules, e-books,	Core Value: *Committed* Sub-Value:	

devices and Sensors (EE 311-CO1)			Learning Module 5 *Asynchronous*	devices and sensors	rating of at least 3.0		*Perseverant in learning* optoelectronic devices and sensors	
EE 311 – ILO11: Identify the different types of transducers and its characteristics (EE 311-CO1) EE 311 – ILO12: Determine the types of input/output transducers and its applications. (EE 311-CO2)	**7. TRANSDUCERS**	6hrs	Discussion via Google Meet *Synchronous* Learning Module 7 *Asynchronous*	Oral report/presentation thru online on transducers	70% of the students shall have a rating of at least 3.0	Modules, e-books	Core Value: *Committed* Sub-Value: *Perseverant in learning* transducers	
EE 311 – ILO13: Understand Pneumatics and Electro-pneumatics as the foundation of PLC and its importance in industry (EE 311-CO1) EE 311 – ILO14: Acquire skills in PLC ladder diagramming (EE 311-CO2)	**8. INTERFACING TECHNIQUE** 8.1 Pneumatics 8.2 Electro-Pneumatics	6hrs	Discussion via Google Meet *Synchronous* Learning Module 7 *Asynchronous*	Laboratory experiment thru simulation of PLC	70% of the students shall have a rating of at least 3.0	Modules, e-books, Manuals	Core Value: *Committed* Sub-Value: *Perseverant in programming plc ladder circuit*	
EE 311 – ILO15: Understand the concepts of Robot and its usefulness in automation (EE 311-CO1)	**9. INTRODUCTION TO ROBOTICS**	6hrs	Discussion via Google Meet *Synchronous* Learning Module 7 *Asynchronous*	Oral report/presentation thru online on Robotics	70% of the students shall have a rating of at least 3.0	Modules, e-books, Manuals	Core Value: *Committed* Sub-Value: *Determined in learning robotics*	

EE 311 – ILO16: Identify the different mechanical configuration of industrial robots (EE 311-CO1) EE 311 – ILO17: Describe the operation of different types of industrial robots.(EE 311-CO2)								
FINAL EXAMINATION – 3.0 Hrs.								

References:

Textbooks

- V Floyd, Thomas L. (2012) Electronic Devices Electron Flow Version
- Boylestad, R. and Nashelsky, L. (201), Electronic Devices and Circuit Theory

Course Requirements:

- Laboratory Reports (CO-AT1)
- Problem Sets (CO-AT2)
- Group Project (CO-AT3)
- Quizzes and Assignments
- Midterm and Final exams

Course Evaluation:

Criteria	Lecture Grade
➢ Quizzes and online outputs/interaction (ILO-AT)	20%
➢ Performance Tasks (CO-AT)	40%
➢ Major Exams (Midterm and Final)	40%
TOTAL	**100%**

Grade Computation: $\frac{Midterm\ Grade + Final\ Grade}{2} = Average\ Grade$

Grade Point	Description
1.0	Excellent
1.5 – 1.1	Very Good
2.0 – 1.6	Highly Satisfactory
2.5 – 2.1	Good
2.9 – 2.6	Satisfactory
3.0	Passing
5.0	Failed due to poor performance, absences, withdrawal without notice
DRP	Dropped with approved dropping slip
INC	Incomplete requirements but w/ passing class standing. INC is for non-graduating students only
NG	No Grade

Source: *SSCT Student Handbook*

Course Policies:

1. Attendance shall be checked in every class session in the Google Meet. This is to monitor the absences incurred by the students in terms of the allowable number of absences for a course as stipulated in the Student Handbook.
2. During online classes, video camera shall be turned on all the time and microphone shall be turned off. The microphone shall be unmuted only if the student's name is called to participate in class discussion.
3. Major examinations in multiple-choice type shall be done online. For problem solving type, detailed solutions shall be written legibly in separate sheets of paper and shall be converted to pdf form prior to submission.
4. Cheating in major examinations which include attempts to defraud, deceive, or mislead the instructor in arriving at an honest assessment shall entail zero score.
5. Plagiarism which is a form of cheating that involves presenting the ideas or work of another as one's own work shall entail zero score.
6. Projects shall be submitted on or before the deadline. Students who submit unsatisfactory projects shall be given the chance to improve their works on the condition that they resubmit the revised outputs on the date set by the instructor. Non-submission of a project on the deadline shall entail zero score.
7. An INC grade shall be given to students who fail to submit the course requirements of at least 95% of the projects and quizzes or failure to take the major examinations.

Revision History:

Revision No.	Revised by	Date of Revision	Date of Implementation	Highlight of Revision
1	ENGR. CONRADO B. DELOSA JR	July 19, 2021	August 23, 2021	DACUM Workshop vis-à-vis CMO No. 101 S. 2017

Prepared by:

ENGR. CONRADO B. DELOSA JR
INSTRUCTOR II

Date: AUG 9, 2021

Checked and reviewed by:

ENGR. VICENTE Z. DELANTE, MEng'g
Program Chair, BSEE

Date: AUG 9, 2021

Noted by:

ENGR. ROBERT R. BACARRO, MECE, MBA
Dean, COLLEGE

Date: AUG 9, 2021

Recommended by:

RONITA E. TALINGTING, PhD
Campus Director

Date: AUG 10, 2021

Approved by:

EMMYLOU A. BORJA, EdD
VP for Academic Affairs

Date: AUG 10, 2021

STUDENTS WHO RECEIVED THE SYLLABUS

Syllabus in EE 311 – INDUSTRIAL ELECTRONICS
First Semester, A.Y 2021 – 2022

NAME AND SIGNATURE	
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ENGR. CONRADO B. DELOSA JR
(Signature of Instructor over printed name)