Surigao City Campus

Bachelor of Science in Electrical Engineering

SURIGAO STATE COLLEGE OF TECHNOLOGY

SSCT

"For Nation's Greater Heights"

I.4.5. development of software for illumination engineering design;

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

Outcomes Based-Education (OBE) Syllabus in EE 121- Elective 3
Energy Supply and Demand Analysis
Course Credit: 3.0 units **(54 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 **S**ocially Responsive **C**ommitted **T**ransformational

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-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. *Enabling* EE-POf. Recognize ethical and professional responsibilities in engineering practice *Demonstrate* EE-POg. Communicate effectively with a range of audiences *Enabling* EE-POi. Recognize the need for additional knowledge and	EE 121 – CO1: The students are able to use the different theories and techniques in forecasting energy demand (EE-POf.) EE 121 – CO2: The students will be able to use logical thinking in analyzing energy demand data through forecasting (EE-POf., EE-POg.) EE 121 – CO3: The students as a team will be able to discuss and explain the concepts used in energy demand forecasting (EE-POi., EE-POf.)	*CO – AT1:* Students conduct oral report thru online in energy demands Criteria – Topic content, presentation Total Points: 100 points *CO – AT2:* Students create project design computing samples of energy demand Criteria – creativity, functionality, delivery *CO – AT3:* Students calculate problem sets on electrical energy supply and demand. Criteria – 70% correct answers and solutions Total Points: 100 points	/	/			/
				/	/	/	
			/	/	/	/	/

engage in lifelong learning *Enabling*							

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

Course Outcomes (CO)	Intended Learning Outcomes (ILO)
EE 121 – CO1: The students are able to use the different theories and techniques in forecasting energy demand (EE-POf.) EE 121 – CO2: The students will be able to use logical thinking in analyzing energy demand data through forecasting (EE-POf., EE-POg.) EE 121 – CO3: The students as a team will be able to discuss and explain the concepts used in energy demand forecasting (EE-POi., EE-POf.)	

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;	**ORIENTATION ON THE COURSE** **VMGO**	1 hr.	*Readings* on SSCT Student Handbook			SSCT Student Handbook Syllabus		

Analyze the syllabus by looking into the ILOs, 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**		Instructor will provide a course outline reflecting 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 121 – ILO1: Explain the importance of energy damand analysis in the power industry (EE 121 – CO3) EE 121 – ILO2: Connect the relationship of Forecasting and Planning (EE 121 – CO3) EE 121 – ILO3: Identify the importance of datas in forecasting (EE 121 – CO3) EE 121 – ILO4: Discuss and Explain different forecasting techniques (EE 121 – CO3)	**1. THE NEED TO ANALYZE ENERGY DEMAND** 1.1 What does the field of forecasting encompass? 1.2 Forecasting relationship to planning 1.3 Examples of different types of forecasting problems 1.4 Importance of up-to-date data 1.5 Collecting data of different kinds 1.6 Knowing the causes the thing I'm forecasting to change 1.7 Forecasting without quantitative (numerical) data	10hrs	Discussion via Google Meet - *Synchronous* Learning Module 1 *Asynchronous*	Oral discussion/participation thru online	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 energy demand analysis*	

EE 121 – ILO5: Apply basics of forecasting techniques (EE 121 – CO1) EE 121 – ILO6: Identify forecast time horizons and types (EE 121 – CO2) EE 121 – ILO7: Discuss and explain the steps of forecasting (EE 121 – CO3)	**2. INTRODUCTION TO FORECASTING** 2.1 Forecasting Time Horizons 2.2 Types of Forecast 2.3 Steps in Forecasting	6hrs	Discussion via Google Meet *Synchronous* Learning Module 2 *Asynchronous*	Identification terms on forcasting	Powerpoint presentation on time series analysis and control	Modules, e-books, textbooks, and worksheets	Core Value: *Committed* Sub-Value: *Determined in learning the forecasting types*	
EE 121 – ILO8:Discuss and Explain time series forecasting (EE 121 – CO3) EE 121 – ILO9: Identify the different components of time series forecasting (EE 121 – CO2) EE 121 – ILO10: Identify common seasonality patterns of time series forecasting (EE 121 – CO2) EE 121 – ILO11: Use the different time series forecasting approach in forecasting Energy	**3.TIME SERIES ANALYSIS AND CONTROL** 3.1 Components of Time Series 3.2Common Seasonality Patterns 3.3 Naïve Approach 3.4 Moving Average 3.5 Exponential Smoothing 3.6 Holt – Winters Method	8 hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 3 *Asynchronous*	Oral discussion /presentation on time series analysis and control	70% of the students shall have a rating of at least 3.0	Powerpoint presentation on time series analysis and control	Core Value: *Committed* Sub-Value: *Determined in learning time series analysis and control*	

Demand(EE 121 – CO1)								
MIDTERM EXAMINATION – 2.0 Hrs.								
EE 121 – ILO12: Enumerate the different forecasting models and methods (EE 121 – CO2) EE 121 – ILO13: Discuss and explain the importance of common sense in forecasting (EE 121 – CO3) EE 121 – ILO14: Calculate forecasting errors (EE 121 – CO2) EE 121 – ILO15: Explain the importance of errors in forecasting (EE 121 – CO3) EE 121 – ILO16: Forecast energy demand data using the different time series forecasting techniques (EE 121 – CO1)	**4.0 FORECASTING APPROACHES** 4.1 Forecasting Models 4.2 Qualitative Methods 4.3 Quantitative Methods 4.4 Trend and Seasonality in Forecasting 4.5 Common Sense and Forecasting 4.6 Forecasting errors	4hrs	Discussion via Google Meet and video viewing *Synchronous* Learning Module 5 *Asynchronous*	Q & A about the forecasting approaches	70% of the students shall have a rating of at least 3.0	Videos online, modules, e-books,	Core Value: *Committed* Sub-Value: *Perseverant in learning forecasting approaches*	
EE 121 – ILO16: Discuss ande Explain the importance of regression method in	**5.0 AUTO REGRESSION AND ASSOCIATIVE REGRESSION**	10hrs	Discussions via Google Meet *Synchronous*	Oral report/presentation thru online on auto regression	70% of the students shall have a	Modules, e-books,	Core Value: *Transformational*	

energy demand analysis (EE 121 – CO3) EE 121 – ILO17: Forecast data using the regression methodologies (EE 121 – CO1) EE 121 – ILO18: Identify the diffent informations that can be obtained using the regression analysis (EE 121 – CO2)	5.1 Associative Models 5.2 The Regression Model 5.3 Mathematical Solution 5.4 Information Obtained from Regression Analysis		Learning Module 6 *Asynchronous*	and associative regression	rating of at least 3.0		Sub-Value: *Optimistic in analyzing auto regression and associative regression*	
FINAL EXAMINATION – 3.0 Hrs.								

References:

Textbooks

- Chaman, Jain L. Fundamentals of Demand Planning and Forecasting
- Padua, Roberto N., Forecasting Time Series
- Armstrong, J. Scott & Green, Kesten C., Demand Forecasting: Evidence-based Methods
- Chand, Smriti, Demand Forecasting: It's Meaning, Types, Techniques and Method Economics

Course Requirements:

- 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 121 EE Elective 3 – Energy Supply and Demand Analysis
First Semester, A.Y 2021 – 2022

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