



SSCT

"For Nation's Greater Heights"

1.3. The curricular content is responsive to the needs of the country and recent developments in the profession.



"For Nation's Greater Heights"

SURIGAO STATE COLLEGE OF TECHNOLOGY
Surigao City

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

Program Educational Objectives

PEO 1

- *Innovative and knowledgeable in the latest trends in electrical engineering and demonstrate in their jobs as professional the technical expertise and practical skills.*

PEO 2

- *Flexible in working with multidisciplinary teams, responsible for providing solutions in electrical engineering showing attributes of professionalism and critical thinking.*

PEO 3

- *Engage in lifelong learning and are taking leadership roles in electrical engineering organization that are valuable to the advancement of the society.*



BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (BSEE)

CMO No. 87, S. of 2017
Effective A.Y 2020-2021

First Year						
First Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
MATH 111	Calculus 1	5	0	5	None	
ES 133	Computer-aided Drafting	0	2	2	None	
GE Math	Mathematics in the Modern World	5	0	5	None	
GE USelf	Understanding the Self	3	1	4	None	
CHEM 121	Chemistry for Engineers	3	0	3	None	
IC 102	Introduction to Electrical Engineering	3	0	3	None	
PE 1	Physical Fitness & Health	2	0	2	None	
NSTP 1	National Service Training Program 1	3	0	3	None	
Sub- Total		24	3	27		

Second Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
Math 112	Calculus 2	5	0	5	Math 111	
Phys 122	Physics for Engineers	3	1	4	Math 111; Co-requisite Math 112	
GE Entrep	The Entrepreneurial Mind	3	0	3	None	
GE IT	Living in the IT Era	3	0	3	None	
CPE 143	Computer Programming	0	1	1	None	
GE Rizal	Life and Works of Rizal	3	0	3	None	
GE PurCom	Purposive Communication	3	0	3	None	
PE 2	Rhythmic Activities	2	0	2	None	
NSTP 2	National Service Training Program 2	3	0	3	NSTP 1	
Sub- Total		25	2	27		

Second Year						
First Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
Math 113	Differential Equations	3	0	3	Math 112	
EE 201	Electrical Circuits 1	3	1	4	Phys 122; Math 112	
ES 255	Engineering Mechanics	3	0	3	Phys 122	
Math 114	Engineering Data Analysis	3	0	3	Math 111	
ES 302	Fluid Mechanics	2	0	2	Phys 122	
GE ArtApp	Art Appreciation	3	0	3	None	
GE EnviSci	Environmental Science	3	0	3	None	
PE 3	PE 3	2	0	2	None	
Sub- Total		22	1	23		

Second Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
Math 161	Engineering Mathematics for EE	3	0	3	Math 113	
EE 202	Electrical Circuits 2	3	1	4	EE 201	
ECE 201	Electronic Circuits: Devices and Analysis	3	1	4	EE 201	
ES 262	Basic Thermodynamics	2	0	2	Phys 122	
ES 137	Engineering Economics	3	0	3	Math 114	
ECE 252	Electromagnetics	4	0	4	Phys 122; Math 113	
GE Eth	Ethics	3	0	3	None	
PE 4	PE 4	2	0	2	None	
Sub- Total		23	2	25		

Third Year						
First Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
EE 301	Numerical Methods and Analysis	2	1	3	Math 161	
ECE 371	Logic Circuits and Switching Theory	3	1	4	ECE 201	
ES 246	Environmental Science and Engineering	3	0	3	None	
GE STS	Science, Technology and Society	3	0	3	None	
EE 311	Industrial Electronics	3	1	4	ECE 201	
EE 312	Fundamentals of Electronic Communications	3	0	3	ECE 201	
EE 302	Electrical Machines 1	2	0	2	ECE 252; EE 202	
ES 261	Fundamentals of Deformable Bodies	2	0	2	ES 255	
Sub- Total		21	3	24		

Second Semester						
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite	
CpE 371	Microprocessor Systems	3	1	4	ECE 371	
EE 304	Electrical Apparatus and Devices	2	1	3	EE 202	
EE 303	Electrical Machines 2	3	1	4	EE 302	
ES 301	Basic Occupational Safety and Health	3	0	3	3rd year standing	
ES 138	Technopreneurship	3	0	3	4 th year standing	
EE 305	EE Law, Codes, and Professional Ethics	2	0	2	GE Eth	
ECE 357	Feedback and Control Systems	3	0	3	Math 161; ECE 201	
GE ConWorld	Contemporary World	3	0	3	None	
Sub- Total		22	3	25		

Summer					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
Practicum	On-the-Job Training	3	240	2	4th Year Standing
Sub- Total		3	240	2	

Fourth Year First Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
ES 142	Materials Science and Engineering	3	0	3	CHEM 121; ES 261
EE 401	Electrical Standards and Practices	0	1	1	EE 305
EE 402	Electrical Systems and Illumination Engineering Design	3	2	5	EE 303
EE 481	Power Systems - Generation and Transmission	3	0	3	4 th year standing
EE 164	Management of Engineering Projects	2	0	2	ES 137
ES 140	Research Methods	0	1	1	Math 114; GE PurCom
EE 403	Instrumentation and Control	2	1	3	ECE 357
IC 105	EE REVIEW 1	2	0	2	4 th year standing
Sub- Total		15	5	20	

Second Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
EE 431	Power Systems Analysis	3	1	4	EE 401
EE 432	Fundamentals of Power Plant Engineering Design	0	1	1	Co-requisite: EE 431
EE 433	Distribution Systems and Substation Design	2	1	3	Co-requisite: EE 431
EE 482	Power Systems - Distribution System and Supply	3	0	3	EE 481
EE 422	Research Project or Capstone Design Project for EE	0	1	1	ES 142
ES 484	Seminars/Colloquia & Field Trips	0	1	1	4 th year standing
IC 106	EE REVIEW 2	2	0	2	4 th year standing
GE Hist	Readings in Philippine History	3	0	3	NONE
Sub- Total		13	5	18	
Grand Total		165	284	188	

SUMMARY		Units
I. Technical Courses		
A. Mathematics		16
B. Natural/Physical Sciences		8
C. Basic Engineering Sciences		11
D. Allied Courses		39
E. Professional Courses		52
F. Electives		6
Sub-Total		132
II. Non-Technical Courses		
A. GE Core Courses		24
B. Electives		9
C. Mandated Courses		3
D. Physical Education		8
E. NSTP		6
Sub-Total		50
III. Institutional Courses		
A. Introduction to Electrical Engineering		2
B. EE Review 1		2
EE Review 2		2
Sub-Total		6
Grand Total		188

Prepared by:

ENGR. JOSELITO BALDAPAN, PEE
Program Chair, BSEE

Noted by:

CARLOS H. DONOSO, EdD
Campus Director, Surigao City Campus

Checked and Reviewed by:

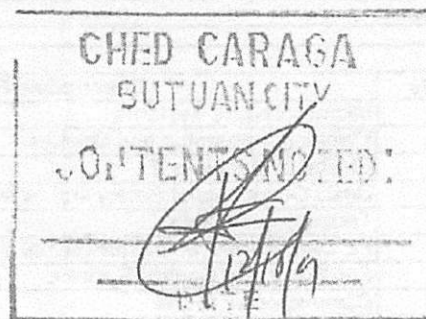
ENGR. ROBERT R. BACARRO, MECE, MBA
Dean, CEIT

Recommended by:

EMMYLOU A. BORJA, EdD
VP for Academic Affairs

Approved by:

GREGORIO Z. GAMBOA, JR., EdD
College President





"For Nation's Greater Heights"



CERTIFICATE NUMBER: AJA19-0225

SURIGAO STATE COLLEGE OF TECHNOLOGY
Surigao City

COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

The **Bachelor of Science in Electrical Engineering (BSEE)** 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.

COURSES	DESCRIPTION
Calculus 1	Basic concepts of calculus such as limits, continuity and differentiability of functions; differentiation of algebraic and transcendental functions involving one or more variables; applications of differential calculus to problems on optimization, rates of change, related rates, tangents and normals, and approximations; partial differentiation and transcendental curve tracing.
Computer-aided Drafting	Concepts of computer-aided drafting (CAD); introduction to the CAD environment; terminologies; and the general operating procedures and techniques in entering and executing basic CAD commands.
Chemistry for Engineers	Basic concepts of matter and its classification; mass relationships in chemical reactions; properties of gases, liquids, and solids; concepts of thermochemistry; quantum theory and electronic behavior; periodic relationship of elements in the periodic table; intramolecular forces; and solutions.
Introduction to Electrical Engineering	This course provides the students a sound background in the theory and concepts of the fundamentals and basic law of electricity and magnetism. Practical applications such as electrical equipment, electrical safety, and electrical symbols are introduced.
Calculus 2	Concept of integration and its application to physical problems such as evaluation of areas, volumes of revolution, force, and work; fundamental formulas and various techniques of integration applied to both single variable and multi-variable functions; tracing of functions of two variables.
Physics for Engineers	Vectors; kinematics; dynamics; work, energy, and power; impulse and momentum; rotation; dynamics of rotation; elasticity; and oscillation.
Computer Programming	Basic information technology concepts; fundamentals of algorithm development; high-level language and programming applications
Differential Equations	Differentiation and integration in solving first order, first-degree differential equations, and linear differential equations of order n; Laplace transforms in solving differential equations.
Electrical Circuits 1	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
Engineering Mechanics	Force, moment, and motion concepts. Newton's Laws of Motion. Analysis of particles and rigid bodies in static and dynamic equilibrium using vector mechanics and energy and momentum methods. Geometric properties of lines, areas, and volumes.
Engineering Data Analytics	This course introduces different methods of data collection and the suitability of using a particular method for a given situation. It includes a coverage and discussion of the relationship of probability to statistics,

	probability distributions of random variables and their uses, linear functions of random variables within the context of their application to data analysis and inference, estimation techniques for unknown parameters, and hypothesis testing used in making inferences from sample to population, inference for regression parameters and build models for estimating means and predicting future values of key variables under study. Statistically based experimental design techniques and analysis of outcomes of experiments are discussed with the aid of statistical software.
Fluid Mechanics	The course deals with the nature and physical properties of fluids as well as the identification and measurement of fluid properties. It emphasizes the application of conservation laws on mass, energy and momentum to fluid systems either incompressible or compressible flow, inviscid or viscous flow as well as head loss calculation on pipes and fittings.
Engineering Mathematics for EE	The study of mathematical methods for solving engineering problems such as complex number, complex variables, Cauchy-Riemann equations, Laplace transformation and Laplace transform analysis, Fourier series and Fourier transform, z transform, power series solutions of ordinary differential equations, partial differential equation, and hypergeometric equations such as Legendre and Bessel functions
Electrical Circuits 2	The course deals with sinusoidal steady-state analysis in the frequency domain; AC circuit power analysis; analysis of polyphase circuits and magnetically-coupled circuits; frequency response; per unit system and symmetrical components; and two-port networks
Electronic Circuits: Devices and Analysis	The course covers the fundamentals of electronics and electronic circuits with their basic applications. This includes diode and transistor characteristics necessary for elementary analysis of electronic circuits with discrete components. The second half of the course covers integrated circuits commonly used in electrical engineering. The course introduces students to the design of electronic circuits for basic applications such as filters, power supplies and op amp signal processors.
Basic Thermodynamics	Basic information technology concepts; fundamentals of algorithm development; high-level language and programming applications
Engineering Economics	Concepts of the time value of money and equivalence; basic economy study methods; decisions under certainty; decisions recognizing risk; and decisions admitting uncertainty
Electromagnetics	The course deals with the study of electric and magnetic fields; resistive, dielectric and magnetic materials, coupled circuits, magnetic circuits and fields, and time-varying electromagnetic fields. It involves a review of vector analysis and types of coordinate system (Cartesian, cylindrical and spherical coordinate systems). Topics covered are dot and cross products of vector, Coulomb's law and electric field intensity of different charge configuration (volume, point, line sheet charge), electric flux density, Gauss's Law, divergence, Maxwell's equations and energy and potential.
Numerical Methods and Analysis	This course covers the concepts of numerical analysis and computer software tools in dealing with engineering problems. It includes techniques in finding the roots of an equation, solving systems of linear and non-linear equations, eigenvalue problems, polynomial approximation and interpolation, ordinary and partial differential equations. The Monte-Carlo method, simulation, error propagation and analysis, the methods of least squares and goodness-of-fit tests are also covered.
Logic Circuits and Switching Theory	This course provides a review of number systems, coding and Boolean algebra; inputs and outputs; gates and gating networks; combinational circuits; standard form; minimization; sequential circuits; state and machine equivalence; asynchronous sequential circuits; race conditions; algorithmic state machines; and design of digital sub-systems.
Environmental Science and	Ecological framework of sustainable development; pollution



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BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (BSEE)

CMO No. 87, S. of 2017
Effective A.Y 2020-2021

First Year					
First Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
MATH 111	Calculus 1	5	0	5	None
ES 133	Computer-aided Drafting	0	2	2	None
GE Math	Mathematics in the Modern World	5	0	5	None
GE USelf	Understanding the Self	3	1	4	None
CHEM 121	Chemistry for Engineers	3	0	3	None
IC 102	Introduction to Electrical Engineering	3	0	3	None
PE 1	Physical Fitness & Health	2	0	2	None
NSTP 1	National Service Training Program 1	3	0	3	None
Sub- Total		24	3	27	

Second Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
Math 112	Calculus 2	5	0	5	Math 111
Phys 122	Physics for Engineers	3	1	4	Math 111; Co-requisite Math 112
GE Entrep	The Entrepreneurial Mind	3	0	3	None
GE IT	Living in the IT Era	3	0	3	None
CPE 143	Computer Programming	0	1	1	None
GE Rizal	Life and Works of Rizal	3	0	3	None
GE PurCom	Purposive Communication	3	0	3	None
PE 2	Rhythmic Activities	2	0	2	None
NSTP 2	National Service Training Program 2	3	0	3	NSTP 1
Sub- Total		25	2	27	

Second Year					
First Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
Math 113	Differential Equations	3	0	3	Math 112
EE 201	Electrical Circuits 1	3	1	4	Phys 122; Math 112
ES 255	Engineering Mechanics	3	0	3	Phys 122
Math 114	Engineering Data Analysis	3	0	3	Math 111
ES 302	Fluid Mechanics	2	0	2	Phys 122
GE ArtApp	Art Appreciation	3	0	3	None
GE EnviSci	Environmental Science	3	0	3	None
PE 3	PE 3	2	0	2	None
Sub- Total		22	1	23	

Second Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
Math 161	Engineering Mathematics for EE	3	0	3	Math 113
EE 202	Electrical Circuits 2	3	1	4	EE 201
ECE 201	Electronic Circuits: Devices and Analysis	3	1	4	EE 201
ES 262	Basic Thermodynamics	2	0	2	Phys 122
ES 137	Engineering Economics	3	0	3	Math 114
ECE 252	Electromagnetics	4	0	4	Phys 122; Math 113
GE Eth	Ethics	3	0	3	None
PE 4	PE 4	2	0	2	None
Sub- Total		23	2	25	

Third Year					
First Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
EE 301	Numerical Methods and Analysis	2	1	3	Math 161
ECE 371	Logic Circuits and Switching Theory	3	1	4	ECE 201
ES 246	Environmental Science and Engineering	3	0	3	None
GE STS	Science, Technology and Society	3	0	3	None
EE 311	Industrial Electronics	3	1	4	ECE 201
EE 312	Fundamentals of Electronic Communications	3	0	3	ECE 201
EE 302	Electrical Machines 1	2	0	2	ECE 252; EE 202
ES 261	Fundamentals of Deformable Bodies	2	0	2	ES 255
Sub- Total		21	3	24	

Second Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
CpE 371	Microprocessor Systems	3	1	4	ECE 371
EE 304	Electrical Apparatus and Devices	2	1	3	EE 202
EE 303	Electrical Machines 2	3	1	4	EE 302
ES 301	Basic Occupational Safety and Health	3	0	3	3rd year standing
ES 138	Technopreneurship	3	0	3	4 th year standing
EE 305	EE Law, Codes, and Professional Ethics	2	0	2	GE Eth
ECE 357	Feedback and Control Systems	3	0	3	Math 161; ECE 201
GE ConWorld	Contemporary World	3	0	3	None
Sub- Total		22	3	25	

Summer					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
Practicum	On-the-Job Training	3	240	2	4th Year Standing
Sub- Total		3	240	2	

Fourth Year First Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
ES 142	Materials Science and Engineering	3	0	3	CHEM 121; ES 261
EE 401	Electrical Standards and Practices	0	1	1	EE 305
EE 402	Electrical Systems and Illumination Engineering Design	3	2	5	EE 303
EE 481	Power Systems - Generation and Transmission	3	0	3	4 th year standing
EE 164	Management of Engineering Projects	2	0	2	ES 137
ES 140	Research Methods	0	1	1	Math 114; GE PurCom
EE 403	Instrumentation and Control	2	1	3	ECE 357
IC 105	EE REVIEW 1	2	0	2	4 th year standing
Sub- Total		15	5	20	

Second Semester					
Course Code	Descriptive Title	Lec	Lab	Units	Pre-requisite
EE 431	Power Systems Analysis	3	1	4	EE 401
EE 432	Fundamentals of Power Plant Engineering Design	0	1	1	Co-requisite: EE 431
EE 433	Distribution Systems and Substation Design	2	1	3	Co-requisite: EE 431
EE 482	Power Systems - Distribution System and Supply	3	0	3	EE 481
EE 422	Research Project or Capstone Design Project for EE	0	1	1	ES 142
ES 484	Seminars/Colloquia & Field Trips	0	1	1	4 th year standing
IC 106	EE REVIEW 2	2	0	2	4 th year standing
GE Hist	Readings in Philippine History	3	0	3	NONE
Sub- Total		13	5	18	
Grand Total		165	264	188	

SUMMARY	Units
I. Technical Courses	
A. Mathematics	16
B. Natural/Physical Sciences	8
C. Basic Engineering Sciences	11
D. Allied Courses	39
E. Professional Courses	52
F. Electives	6
Sub-Total	132
II. Non-Technical Courses	
A. GE Core Courses	24
B. Electives	9
C. Mandated Courses	3
D. Physical Education	8
E. NSTP	6
Sub-Total	50
III. Institutional Courses	
A. Introduction to Electrical Engineering	2
B. EE Review 1	2
EE Review 2	2
Sub-Total	6
Grand Total	188

Prepared by:

ENGR. JOSELITO BALDAPAN, PEE
Program Chair, BSEE

Noted by:

CARLOS H. DONOSO, EdD
Campus Director, Surigao City Campus

Checked and Reviewed by:

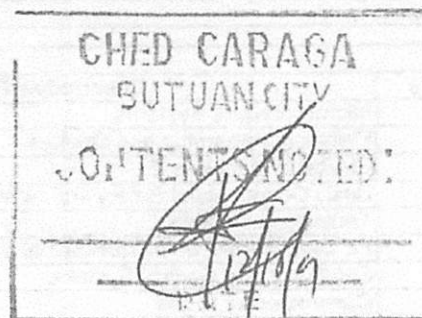
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Numerical Methods and Analysis	This course covers the concepts of numerical analysis and computer software tools in dealing with engineering problems. It includes techniques in finding the roots of an equation, solving systems of linear and non-linear equations, eigenvalue problems, polynomial approximation and interpolation, ordinary and partial differential equations. The Monte-Carlo method, simulation, error propagation and analysis, the methods of least squares and goodness-of-fit tests are also covered.
Logic Circuits and Switching Theory	This course provides a review of number systems, coding and Boolean algebra; inputs and outputs; gates and gating networks; combinational circuits; standard form; minimization; sequential circuits; state and machine equivalence; asynchronous sequential circuits; race conditions; algorithmic state machines; and design of digital sub-systems.
Environmental Science and	Ecological framework of sustainable development; pollution

Engineering	environments: water, air, and solid; waste treatment processes, disposal, and management; government legislation, rules, and regulation related to the environment and waste management; and environmental management system.
Industrial Electronics	This course teaches the theory and operation of solid-state devices and control circuits for industrial processes; industrial control applications; electronics instrumentation; transducers; data acquisition system, power supply and voltage regulator. It also covers photo electronics, sensors and instruments used in industrial applications. It includes variable frequency drives, DC motor, servomotors and stepper motor drives; application of relay logic circuits; and interfacing and programming of PLCs
Fundamentals of Electronic Communications	Fundamental principles of electronic communications theory and its applications. Emphasis is on the introduction of electronic communication systems, analysis and calculations of analog and digital modulation, transmission and reception. Provides insights, framework, knowledge and competencies necessary in analyzing basic communication system as a preparation for electronics engineering profession.
Electrical Machines 1	The course deals with the fundamentals of DC machinery; DC motors and generators
Fundamentals of Deformable Bodies	The course deals with the study of strength of materials where the understanding of how bodies and materials respond to applied loads is the main emphasis. The course covers the fundamental concepts of stresses and strains experienced and/or developed by different materials in their loaded state and subjected to different conditions of constraint that includes axial stress, shearing stress, bearing stress, torsion, flexural stress, and stress-strain relationships.
Microprocessor Systems	The course includes history and evolution, principles, and applications of microprocessors. The focus is on the basic understanding of the architectural design, functional parts, operations, function and programming. It also covers the study of various types of microprocessors and the fundamental concepts of microcontrollers.
Electrical Apparatus and Devices	This course provides characteristics, principle of operation, and applications of single-phase and three-phase transformers, and protective devices such as fuses and circuit breakers. It includes various types of transformers based on different criteria, types of fuses and circuit breakers, parallel operation of transformers, and standard ratings.
Electrical Machines 2	The course deals with the fundamentals of AC machinery; synchronous generators and motors; induction motors; single phase and special-purpose motors
Basic Occupational Safety and Health	The course tackles key Occupational, Health and Safety (OSH) concepts, principles and practices that are foundational knowledge requirements acceptable in almost all industries; determination of existing and potential safety and health hazards; identification of control measures; provisions of Philippine laws that refer to occupational safety and health
Technopreneurship	Technopreneurship is a course on entrepreneurship with emphasis on the technology industry. The course introduces specific issues and characteristics found in the technology industry like history of technology, technology organization, marketing technology, financing technology ventures, governmental and legal factors like patents and copyright and technology strategies. The course also covers the value of professional and life skills in entrepreneurial thought, investment decisions, and actions that students can utilize in starting
EE law, Codes, and Professional Ethics	The course is designed to prepare electrical engineering students for professional practice. Topics include education and practice of the New Electrical Engineering Law and other laws governing the profession, Philippine Grid Code, Philippine Distribution Code, Basic Contracts and ethics in relation to the practice of the electrical engineering profession
Feedback and Control Systems	This course deals with the basics of control systems; terminologies and

	<p>diagrams; homogeneous and transient responses of systems; systems representation such as transfer functions, state-space analysis of phase variables and techniques, nth order linear differential equations; modeling, pole-zero gain data and frequency response data; Laplace transforms; block diagrams interconnections and simplifications; signal flow graphs; conversion of block diagrams to signal flow graphs and vice versa; root locus; Bode, Nyquist and Polar plots; PID controllers; sensitivity and stability criteria; linear feedback systems; and compensation techniques</p>
On-the-Job Training	<p>Industry exposure of students for them to match school acquired competencies and knowledge with the realities and problems of industry. This may include involvement in industry manpower requirements, development and research concerns, training, and applications of principles, environmental concerns, ethical and behavioral concerns, decision-making, equipment and materials management. The student shall prepare a thesis on a topic covered by his/her experiences.</p>
Materials Science and Engineering	<p>The course deals with the properties of engineering materials including mechanical, acoustical, electrical, magnetic, chemical, optical and thermal properties</p>
Electrical Standards and Practices	<p>This course provides the different electrical practices in accordance to local and international standards.</p>
Electrical Systems and Illumination Engineering Design	<p>The course provides knowledge, understanding and skills in designing electrical wiring system for residential, commercial buildings, and industrial facilities through the specifications and standards mandated by the Philippine Electrical Code and provisions from the Local Government on electrical wiring installation. The course includes illumination design and cost estimation; energy-efficient lighting systems for residential, commercial, and industrial establishments; roadway lighting, and lighting maintenance.</p>
Power System-Generation and Transmission	<p>This course deals with the study on the basic structure of power systems, recent trends and innovations in power systems, transmission line parameters, network modeling and calculations, load flow studies, short circuit calculations and use of computer software for simulation</p>
Management of Engineering Projects	<p>The course covers the principles of management, theory and practice, various approaches to decision making, managing production and services operations; and project management. Emphasis is also given on the managerial functions of planning, organizing, staffing, leading and controlling.</p>
Research Methods	<p>This course covers the study of the methodologies used in conducting an engineering research. It includes the types and application of research, characteristics of a good research, research design, research instrument and data gathering procedures. It also deals with the study of writing a research proposal and various formats.</p>
Instrumentation and Control	<p>The course deals with the study on control and testing: electromechanical, analog and digital measuring and testing instruments; R, L and C measurements: calibration; graphic and waveform analyzing instruments; detectors for the measurements of process variables; analysis of performance characteristics of control systems; electronics, magnetic, hydraulic and mechanical control. It includes principles of controls and test measurements involving sensors, pneumatic controls, actuators, thermal detectors, thermocouples, thermistors, transducers, PID controllers.</p>
EE Review 1	<p>This course is a 2 unit lecture intended for 4th year standing Electrical Engineering students. The course includes topics on Engineering mathematics that are relevant to electrical engineering practice and board exam.</p>
Power Systems Analysis	<p>This course deals with the study on the basic structure of power systems, recent trends and innovations in power systems, transmission line</p>

	parameters, network modeling and calculations, load flow studies, short circuit calculations and use of computer software for simulation
Fundamentals of Power Plant Engineering Design	It covers topics on load graphics, types of power plants, power plant operation and protection, interconnections, economics of electric service, and arrangement of equipment for modern plants and includes the design of a power plant, its interconnection, operation, economics, and protection.
Distribution Systems and Substation Design	The course deals with study and design of primary and secondary distribution networks, load characteristics, voltage regulation, metering techniques and systems, and protection of distribution systems.
Power Systems – Distribution System and Supply	<p>This course covers the different levels of distribution voltages, different types of substations installed in a distribution utility, substation major equipment and their functions; overview of power system protection, overview of SCADA, applicable rules and regulations in distribution systems, and distribution rates and pricing.</p> <p>This course covers the integration of generation, transmission, and distribution sectors in order to provide electric supply for end-use. Also covered is an illustration of the whole power industry and the complex relationship of its players; strategies on how to maximize spot market benefits involving pricing and other related factors; value-added topics related to electric supply, including self-generation and Smart Grid; and applicable rules and regulations to provide an up-to-date regulatory environment.</p>
Research Project or Capstone Design Project for EE	This is the capstone course which utilizes the fundamentals of electrical engineering in the design of an electrical system. It includes the synthesis of processes, analysis of process conditions and the analytic, heuristic and optimum design of equipment and processes. Economic analysis is included to estimate the cost of equipment, capital investment, total product cost and profitability
Seminars/Colloquia & Field Trips	The course involves the attendance and participation of EE graduating students in technical seminars/workshops related to the field of Electrical Engineering. Students are also required to attend non-technical seminars and training for the enhancement of their personality. It also involves short lectures on current trends and recent developments in the EE field. It may include educational visits to selected companies and manufacturing plants.
EE Review 2	This course is a 2 unit lecture intended for 4 th year standing Electrical Engineering students. The course includes topics on Professional Electrical Engineering subjects that are relevant to electrical engineering practice and board exam.



"For Nation's Greater Heights"

SURIGAO STATE COLLEGE OF TECHNOLOGY

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COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY 1st Semester, Academic Year 2019-2020

COURSE SYLLABUS in EE 101 – CIRCUIT 1

Institutional Vision, Mission, and Goals

SSCT Vision:

An innovative, technologically-advanced State College in Caraga.

SSCT Mission:

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

SSCT 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.

Institutional Intended Learning Outcomes

: SSCT graduates are expected to:

1. Innovation and technical skills;
2. Exhibit critical thinking collaboration, and communication;
3. Manifest leadership, adaptability and responsibility.

Programs 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.

Programs Educational Objectives: The BS Electrical Engineering program is geared towards producing graduates who have the following attributes within three to five years from graduation:

1. Graduates demonstrate technical expertise and practical skills in the field of electrical engineering.
2. Graduates demonstrate flexibility in working with multidisciplinary teams and apply professional and ethical responsibility in the practice of electrical engineering.
3. Graduates are engaged in lifelong learning and knowledgeable in contemporary issues relevant to the field of electrical engineering.

Program Outcome(s) Upon the completion of the course, the students must able to:

- a. Apply knowledge of mathematics and sciences to solve complex engineering problems; - **enabling**
- b. Develop and conduct appropriate experimentation, analyze and interpret data; - **demonstrate**
- c. Function effectively on multi-disciplinary and multi-cultural teams that establish goals, plan tasks, and meet deadlines; - **enabling**
- d. Communicate effectively with a range of audiences; - **demonstrate**
- e. Apply techniques, skills, and modern engineering tools necessary for electrical engineering practice; - **enabling**
- f. Demonstrate knowledge and understanding of engineering and management principles as a member and/or leader in a team to manage projects in multi-disciplinary environment. - **demonstrate**

Course Code EE 101
Course Title CIRCUIT 1
Course Credit 3 units lecture, 1 unit laboratory
Pre-requisites/Co-requisites Physics 102, MATH 107

Course Description: This is a 3-unit course covers the basic concepts and fundamental laws of electrical circuit theory; analysis and application of series, parallel and series-parallel resistive circuits; mesh and nodal analysis theorems; characteristics of inductors and capacitors; analysis of RL, RC, and RLC circuits with excitation.

Course Intended Learning Outcomes At the end of the course, the students should be able to:

Detailed Course Syllabus

Intended Learning Outcome	Topics	Time Frame	Teaching and Learning Activities	Assessment Tasks	Resources	Values Integration	References	Remarks
<p>Express understanding of the Vision and Mission statements of SSCT, including its Goals and Objectives;</p> <p>Analyze the syllabus by looking into the ILOs, Subject Matter, TLAs, Assessment Strategies, Values and References; and</p> <p>Design strategies that will help meet the requirements and obtain desired grades/marks for the course</p>	<p>ORIENTATION ON THE COURSE</p> <p>VMGO</p> <p>Syllabus</p> <p>Grading System</p>	<p>1 hr</p>	<p><i>Big Group Discussion on VMGO</i></p> <p><i>Documentary Analysis of Syllabus and Grading System</i></p> <p><i>Concept Mapping (Sunflower Map/Fishbone Map) on strategies to meet course requirements</i></p>		<p>Computer/ Projector for Power point presentation of the VMGO</p> <p>Syllabus</p>	<p>Obedience, Punctuality, Diligence</p>	<p>Student Handbook</p>	
<p>Identify basic electrical quantities, electrical units,</p>	<p>1. BASIC ELECTRICAL QUANTITIES SYSTEM OF</p>	<p>4 hrs.</p>	<p><i>Small Group Discuss on electrical quantities, electrical units and</i></p>	<p><i>Problem set Compilation on the Basic Electrical</i></p>	<p>Whiteboard Marker Handouts</p>	<p>Appreciating the complex of the lesson</p>	<p>Alexander C. & Sadiku M. 4th Edition</p>	

and electrical components Identify and solve Ohm's Law and Kirchhoff's Law	UNITS; CIRCUIT COMPONENTS 2. OHM'S LAW AND KIRCHHOFF'S LAWS	4 hrs.	components <i>Small Group Discuss on the Ohm's Law and Kirchhoff's Law</i>	Quantities system of units; Circuit components as well as Ohm's Law and Kirchhoff's Laws			(2009) Charles Alexander, Matthew Sadiku- Fundamentals of Electric Circuits (2012, McGraw-Hill Science-Engineering Math)	
Identify and Analyze Series-Parallel Circuits Solve complex Series-Parallel Circuits Problems Learn the application of different types of circuits	3. ANALYSIS OF SERIES, PARALLEL, SERIES-PARALLEL CIRCUITS 4. APPLICATIONS OF RESISTIVE CIRCUITS- RESISTANCE BRIDGE CIRCUITS; BIASING CIRCUITS VOLTAGE DIVIDER CIRCUITS; ANALOG METERS	4 hrs. 4 hrs. 2 hrs.	<i>Small group discussion and Brainstorming: Analyze Series-Parallel Circuits and problems</i> <i>Hands-on Laboratory Activity on Applications of resistive circuits- resistance bridge circuits.</i>	<i>Problem set Compilation on the Analysis of resistive circuits with controlled sources and network theorems</i> Rubrics: Accuracy: 40 Timeliness 30 Attitude/teamwork 30 TOTAL 100	Whiteboard Marker Handouts	Self-confidence in understanding and appreciating the lesson	Alexander C. & Sadiku M. 4 th Edition (2009) Charles Alexander, Matthew Sadiku- Fundamentals of Electric Circuits (2012, McGraw-Hill Science-Engineering Math)	
Analyze and Solve complex	5. ANALYSIS OF RESISTIVE	4 hrs.	<i>Small group discussion and</i>	<i>Problem set Compilation</i>	Whiteboard Marker	Awareness in dealing	Alexander C. & Sadiku M.	

<p>Series-Parallel Circuits problems with controlled sources</p> <p>Analyze and Solve Complex Series-Parallel Circuits problems with controlled sources using circuit analysis techniques and network theorems such as Thevenin and Norton Theorems</p>	<p>CIRCUITS WITH CONTROLLED SOURCES</p> <p>6. CIRCUIT ANALYSIS TECHNIQUES AND NETWORK THEOREMS</p>	<p>4 hrs.</p> <p>2 hrs.</p>	<p><i>Brainstorming:</i> on Series-Parallel Circuits problems and network theorems of Thevenin and Norton Laws</p> <p><i>Hands-on Laboratory Activity</i> on Circuit analysis techniques and network theorems</p>	<p>on the Analysis of resistive circuits with controlled sources and network theorems</p> <p>Rubrics: Accuracy: 40 Timeliness 30 Attitude/teamwork 30 TOTAL 100</p>	<p>Handouts</p>	<p>with the difficulties in lesson</p>	<p>4th Edition (2009)</p> <p>Charles Alexander, Matthew Sadiku- Fundamentals of Electric Circuits (2012, McGraw-Hill Science-Engineering Math)</p>		
<p>MIDTERM EXAMINATION (3 hours)</p>									
<p>Identify inductors and Capacitors</p> <p>Analyze the DC response of inductors and capacitors</p>	<p>7. FUNDAMENTALS OF INDUCTORS AND CAPACITORS</p>	<p>8 hrs.</p> <p>2 hrs.</p>	<p><i>Small group discussion and Brainstorming:</i> on characteristics of internal forces in rigid bodies, proper plotting and labelling of structural members</p> <p><i>Hands-on Laboratory Activity</i> on inductors and</p>	<p><i>Problem set Compilation</i> on the Internal Forces</p> <p>Rubrics: Accuracy: 40 Timeliness 30</p>	<p>Whiteboard Marker Handouts</p>	<p>Self-confidence in understanding and appreciating the lesson</p>	<p>Alexander C. & Sadiku M. 4th Edition (2009)</p> <p>Charles Alexander, Matthew Sadiku- Fundamentals of Electric Circuits (2012,</p>		

			capacitors	Attitude/teamwork 30 TOTAL 100			McGraw-Hill Science- Engineering Math)	
Identify and Analyze first order dynamic circuits Solve complex problems	8. ANALYSIS OF FIRST ORDER DYNAMIC CIRCUITS WITH DC EXCITATION	8 hrs 2 hrs.	<i>Small group discussion and Brainstorming:</i> on First order dynamic circuits and complex problems <i>Hands-on Laboratory Activity</i> on first order dynamic circuit with DC excitation	<i>Problem set Compilation</i> on the Analysis of first order dynamic circuits with DC excitation <i>Rubrics:</i> Accuracy: 40 Timeliness 30 Attitude/teamwork 30 TOTAL 100	Whiteboard Marker Handouts	Self- confidence in understandin g and appreciating the lesson	Alexander C. & Sadiku M. 4 th Edition (2009) Charles Alexander, Matthew Sadiku- Fundamenta ls of Electric Circuits (2012, McGraw-Hill Science- Engineering Math)	
Analysis and solve complex second order dynamic circuits	9. ANALYSIS OF SECOND-ORDER DYNAMIC CIRCUITS WITH DC EXCITATION	8 hrs. 2 hrs.	<i>Small group discussion and Brainstorming:</i> on the Analysis and complex second order dynamic circuits <i>Hands-on Laboratory Activity</i> on second order dynamic circuit with	<i>Problem set Compilation</i> on the Analysis of Second- order Dynamic Circuits with DC Excitation <i>Rubrics:</i> Accuracy: 40 Timeliness 30 Attitude/teamwork 30	Whiteboard Marker Handouts	Self- confidence in understandin g and appreciating the lesson	Alexander C. & Sadiku M. 4 th Edition (2009) Charles Alexander, Matthew Sadiku- Fundamenta ls of Electric Circuits (2012, McGraw-Hill Science-	

			DC excitation	TOTAL 100			Engineering Math)	
FINAL EXAMINATION (3 hours)								

Course Requirements:

- Individual Reports
- Graphic Organizers
- Group Project
- Midterm & Final Examination

Grading System:


<u>Criteria:</u> Academic Subjects	<u>Lecture Grade</u>	<u>Laboratory Grade</u>
➤ Quizzes/ Problem Sets	20%	
➤ Project	30%	
➤ Laboratory Exercises		50%
➤ Laboratory Reports		50%
➤ Major Examination	<u>50%</u>	<u> </u>
TOTAL	100%	100%

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

Course Policies:

1. Attendance sheet will be passed around and the student is responsible to sign to prove his/her presence for that sessions. This is to monitor whether absences incurred by the student is still within the allowed number of absences for a course stipulated in the Student Handbook.
2. Excuse from the class will only be honored if a Memo from the school is issued before the absence or valid excuse letter from parents/guardians is presented after the absence. No other excuses will be entertained.
3. It is a part of your education to learn responsibility and self-discipline, particularly with regards to academic honesty. Cheating is defined to include an attempt to defraud, deceive, or mislead the instructor in arriving at honest grade assessment. Plagiarism is a form of cheating that involves presenting as one's own work the ideas or work of another. Therefore, all portions of any test, project, or major examination submitted by you for a grade must be your own work, unless you are instructed to work collaboratively. Cheating in a major course examination by a student will entail a failing mark for the given course. Plagiarism in papers and other works will entail zero score for the said requirement.
4. The use of multiple choice questionnaires is used during the exams. However, detailed solution to the problem should be written legibly in a clean long size bond paper.
5. Unsatisfactory project will not be accepted. However, the student/group will be given a chance to improve their project. Non-submission of the project on the set deadline means an automatic final grade of 5.
6. Exemptions from taking the final examination are as follows: (1) No exam below 60%, (2) No missed quizzes/exams, (3) Laboratory reports are submitted on the specified date, (4) The project is submitted on the specified deadline, and (5) Absences do not exceed the maximum allowed.
7. This class policy serves as our written agreement for the whole semester.

Prepared by:


ENGR. VERNON V. LIZA

Faculty

Date: Aug 4, 2019

Checked and Reviewed by:


ENGR. JOSELITO S. BALDAPAN, PEE


Program Chair, BSEE

Date: Aug 5, 2019


ENGR. DARWIN C. MANGCA

Program Chair, BSECE

Date: Aug 5, 2019


ENGR. ANALYN S. MORITE, Ph.D. TM

Program Chair, BSCpE

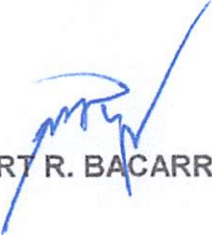
Date: Aug 5, 2019


ENGR. VIRNE V. PORTUGUES

Program Chair, BSCE

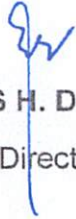
Date: Aug 5, 2019

Noted by:


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

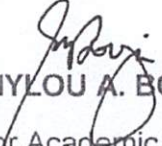
Date: Aug. 5, 2019

Recommended by:


CARLOS H. DONOSO, EdD
Campus Director

Date: Aug. 5, 2019

Approved by:


EMMYLOU A. BORJA, EdD
VP for Academic Affairs

Date: Aug. 5, 2019



COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY

TABLE OF SPECIFICATION

MIDTERM

First Sem., A.Y. 2019-2020

EE 101 - CIRCUITS 1

Topics	Time Frame (hr)	Weight Percentage	Item Number					Total No. of Items
			Remembering 0%	Understanding 0%	Applying 27%	Analyzing 71%	Evaluating 0%	
1. BASIC ELECTRICAL QUANTITIES SYSTEM OF UNITS; CIRCUIT COMPONENTS	3	13%				5		1
2. OHM'S LAW AND KIRCHOFF'S LAW	4	17%				9, 11		2
3. ANALYSIS OF SERIES, PARALLEL, SERIES-PARALLEL CIRCUITS	4	17%			7	1		2
4. APPLICATION OF RESISTIVE CIRCUITS	4	17%			8, 10			2
5. ANALYSIS OF RESISTIVE CIRCUITS WITH CONTROLLED SOURCES	4	17%				2, 3		2
6. CIRCUIT ANALYSIS TECHNIQUES AND NETWORK THEOREMS	5	21%				4, 6		2
Total	24	100%	0	0	3	8	0	11

Prepared by:

Vernon V. Liza
VERNON V. LIZA
Guest Lecturer

Date: Oct. 4, 2019

Checked by:

Engr. Joselito S. Baldapan
ENGR. JOSELITO S. BALDAPAN, PEE
Program Chair

Date: Oct. 4, 2019

Approved by:

Engr. Robert R. Bacarro
ENGR. ROBERT R. BACARRO, MECE, MBA
Dean

Date: Oct. 4, 2019

To compute the weight percentage per topic: Divide the number of hours by the total hours times 100.

To determine the number of items per topic: Multiply the corresponding weight by the total number of items. (Items should be distributed to the different levels)



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COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY

TABLE OF SPECIFICATION

FINAL

First Sem., A.Y. 2019-2020
EE 101 - CIRCUITS 1

Topics	Time Frame (hr)	Weight Percentage	Item Number					Creating 0%	Total No. of Items
			Remembering 0%	Understanding 0%	Applying 22%	Analyzing 67%	Evaluating 11%		
1. FUNDAMENTALS OF INDUCTORS AND CAPACITORS	8	32%			8	4, 5			3
2. ANALYSIS OF FIRST ORDER DYNAMIC CIRCUITS WITH DC EXCITATION	8	32%				1, 2	7		3
3. ANALYSIS OF SECOND ORDER DYNAMIC CIRCUITS WITH DC EXCITATION	9	36%			9	3, 6			3
Total	25	100%	0	0	2	6	1	0	9

Prepared by:
Vernon W. Liza
VERNON W. LIZA
Guest Lecturer

Date: Oct. 4, 2019

Checked by:
Engr. Joselito S. Baldapan
ENGR. JOSELITO S. BALDAPAN, PEE
Program Chair

Date: Oct. 4, 2019

Approved by:
Engr. Robert R. Bacarro
ENGR. ROBERT R. BACARRO, MECE, MBA
Dean

Date: Oct. 4, 2019

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