

## **THE COLLEGE OF ENGINEERING AND TECHNOLOGY**

The College of Engineering Technology is dedicated to empower future engineers of both gender with quality education and creative ability to advance industrial modernization and technological development. It is a *service oriented* College that believes in the interdependence of man and nature.

### ***Vision***

The College aspires to provide a multidisciplinary environment geared towards nurturing and developing future Engineers with appropriate and environmentally friendly (green) technology for Africa and the world.

### ***Mission***

The College of Engineering & Technology is *dedicated to empowering future engineers* with quality education and creative ability to transform their environment for the ecological service of humanity. It also aims to empower its graduates as professional entrepreneurs able to create employment while striving to utilize resources for the service of humanity.

### ***Overall Program Description***

The Engineering and Technology programs are 5 year programs. For the first two years of all engineering students they are required to take a set of common courses in general education and engineering sciences. During their third year they are exposed to their majors, while taking additional core courses in the area of science, mathematics, general engineering, computer aided analysis and graphics using MATHCAD and AUTOCAD software. They completely focus on the courses of their major field during the last three years of the curriculum.

## ***Bachelor of Science in Electrical Engineering***

### ***Program Description***

The Electrical Engineering Program is designed to provide the educational requisites in the training of men and women for the Bachelor of Science in Electrical Engineering. The coursework is grounded in sciences and technology while the learning objectives are based on mathematical solutions founded on logic and principles of analysis. The program in Electrical Engineering seeks to provide a solid foundation in the current theory and practice of electrical engineering, including familiarity with basic tools of math and science as well as the ability to communicate ideas. Graduates will be qualified either to enter the profession of Electrical Engineering, or to continue toward graduate studies. Core electrical engineering courses cover the main components of modern electrical engineering. Topics include courses on circuit theory, machine theory, electro magnetism, communication, control theory, signals and systems. Students are also exposed to the following major of concentration: Electric Power System Engineering, Sustainable Energy Engineering, Communication System Engineering and/or Computer Systems Engineering.

### ***Program Objectives***

- To develop *competent engineers* who have reliable ability not only to recognize problems but to design creative solutions to the problems in relation to construction, manufacture, and other various requirements of electrical engineering.
- To train engineers knowledgeable of engineering science and designs, and are capable of analyzing, designing, constructing and installing various systems associated with the power, communication or computer industry.
- To prepare engineers who are cognizant of their professional, ethical and social economic responsibility to society and the environment as a whole.

### ***Student Learning Outcomes***

Students will be able to:

- Demonstrate knowledge of the mathematical and scientific foundation of Electrical Engineering
- Demonstrate knowledge and ability to analyze, design and build electrical and electronic circuits and structures associated with their area of concentration.
- Understand the importance of engineering ethics, environmental safety, entrepreneurship and professionalism
- Demonstrate all of the above knowledge by sitting and successfully passing a professional qualifying exam.

***Curriculum Requirements:***

- 52 Credits of General Education Courses
- Maximum of 167-173 core and professional courses

***Core Requirements***

- Mathematics, Physics, And Chemistry
- Social Sciences, Environmental Science & Safety
- Engineering Graphics, Engineering Analysis & Design, Engineering Management
- Circuits And Field Theory
- Control System Theory

***Concentration Options***

- Communication & Control Systems Engineering, Computer & Information System Engineering or Power & Energy Systems Engineering
- Internship/Coop

***Cognate Requirements***

- Principles of engineering analysis & design
- Algebra, Geometry, Trigonometry, and Calculus
- Engineering graphics and Computer-Aided design
- Circuits and Field Analysis & Design Skills

## *Bachelor of Science in Electrical Engineering*

### *First Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG 102	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 101	Intro to Engineering Drawing I	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	Total	21		Total	20

### *Second Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3	PHY 202	Physics for Engineers II	4
MATH 201	Differential Calculus	3	MATH202	Integral Calculus	3
PHY 201	Physics for Engineers I	4	MATH 206	Intro to Linear algebra	3
GENG 203	Introduction to Engineering Drawing II	1	GENG 202	Engineering Graphics/ CAD I	3
EVS 201	Introduction to Environmental Science	3			
	TOTAL	20			19

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
MATH 301	Multivariable Calculus	3	EENG 302	Engineering Electrodynamics	3
EENG 301	Electrical Networks I	3	MATH 302	Ordinary Differential Equations	3
EE 301	Entrepreneurship Education I		EE 302	Entrepreneurship Education II	
CENG 301	Surveying I	3	EENG 304	Electrical Networks II	3
GENG 301	Engineering Mechanics I (Statics)	3	GENG 306	Electrical Fundamentals	3
EENG 303	Electrical Workshop	2	EENG 308	Electrical Power and Machines	3
GENG 305	Computer Programming (MATLAB)	3	GENG 310	Internship	1
GENG 307	Material Science	3			
<b>Total</b>		<b>20</b>	<b>Total</b>		<b>16</b>

**Fourth Year**

First			Second		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
EENG 401	Electronics I (Analog)	2	EENG 402	Electronics II (Digital)	2
EENG 403	Electromagnetic Field Theory	3	EENG 404	Communication Systems	3
GENG 403	Engineering Management I	3	EENG 406	Electrical Machinery	3
EENG 407	Control Systems I	2	GENG 408	Engineering Economics	3
EENG 409	Power Systems	3	EENG 408	Instrumentation and Measurement	2
			GENG 412	Research Methodology	1
<b>Total</b>		<b>13</b>	<b>Total</b>		<b>14</b>

**Summer Internship**

Course Code	Course Title	Credit Hours
GENG 400	Internship	1

*Fifth Year*

<b>First</b>			<b>Second</b>		
<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
Code	Course Title	Credit	Code	Course Title	Credit
EENG 501	Signals and Systems(DSP)	3	EENG 500	EE Seminar	1
EENG 503	Power Electronics	3	EENG 502	Power Systems Protection	3
GENG 505	Electrical Engineering Project Design	4	EENG 504	High Voltage Engineering	3
EENG 507	Power Systems Analysis	3	EENG 506	Optical Fiber Communication Systems	3
EENG 509	Control Systems II	2	EENG 508	Electric Machines and Drives	3
<b>Cumulative Minimum Credits Required For Graduation</b>					<b>168</b>

## *Bachelor of Science in Civil Engineering*

### *Program Description*

The Civil Engineering Program is designed to provide the educational requisites in the training of men and women for the degree of Bachelor of Science in Civil Engineering. The coursework is rooted from sciences and technology, while the learning objectives are based on mathematical solutions, founded on logic and principles of analysis. The Department of Civil Engineering trains students in the analysis, design, construction, maintenance and operation of small and large-scale physical systems. The current reconstruction and rehabilitation of the nation's roads, bridges, buildings, water and sewer systems and many other physical facilities are the focus of the profession. The magnitude of the rehabilitation also requires civil engineers to develop skills in communication, management and teamwork. The course of study for a degree in Civil Engineering takes five (5) academic years (including vacation breaks for experiential learning) and covers topics in the three areas of concentration: Structural Engineering, Highway Engineering and Environmental (Water, Air and Solid waste) Engineering. The program does not only prepare graduates for professional practice but it also motivates the students to pursue graduate studies.

### *Program Objectives*

- To develop **competent engineers** who are able to recognize and design solutions to problems in relation to construction, manufacture, and various other requirements of civil engineering.
- To train engineers **knowledgeable** of engineering science and designs, and are capable of analyzing needs, designing and building various structures, roads, bridges, and other civil works.
- To prepare engineers who are **cognizant** of their professional, ethical and socio- economic responsibility to society and the environment as a whole.

### *Student Learning Outcomes*

Students are able to:

- Demonstrate knowledge of the mathematical and scientific foundation of Mechanical Engineering
- Demonstrate Knowledge and ability to design and construct various mechanical systems in keeping with established standards and specifications.
- Calculate for and build various machine parts
- Understand the importance of engineering ethics, environmental safety, entrepreneurship and professionalism
- Demonstrate all of the above knowledge by sitting and successfully passing a professional qualifying exam

### *Curriculum Requirements Total Credits 169*

General Education	-52 Credits
Engineering Math/Science	- 27 Credits
General Engineering Courses	- 48 Credits

Major - 31 Credits  
 Conc/Technical Elective - 11 Credits

**Core Requirements**

- Mathematics, physics, and chemistry
- Social Sciences, environmental science & safety
- Engineering graphics, engineering analysis & design, engineering management
- Analysis and design of civil structures

**Concentration Options**

- highway engineering, construction engineering or environmental engineering
- Internship

**Cognate Requirements**

- Principles of engineering analysis
- Algebra, Geometry, Trigonometry, and Calculus
- Engineering graphics and structural designs
- Strength and properties of materials
- Design of civil structures and buildings

**Bachelor of Science in Civil Engineering**

**First Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG I02	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 106	Intro to Engineering Analysis and Design	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	Total	21		Total	20



**Second Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3	PHY 202	Physics for Engineers II	4
MATH 201	Differential Calculus	3	MATH202	Integral Calculus	3
PHY 201	Physics for Engineers I	4	MATH 206	Intro to Linear algebra	3
GENG 203	Introduction to Engineering Drawing II	1	GENG 202	Engineering Graphics/ CAD I	3
EVS 201	Introduction to Environmental Science	3			
	TOTAL	20			18

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
GENG 301	Engineering Mechanics I	3	GENG 304	Engineering Mechanics II	3
MATH 301	Multivariable Calculus	3	MATH 302	Ord. Differential Calculus	3
GENG 309	Electrical Fundamentals	4	CENG 302	Surveying II	4
CENG 301	Surveying I	4	GENG 308	Strength of Materials	3
GENG 305	Computer Programming (MATLAB)	3	MENG 3xx	Technical Elective – MENG Manufacturing Process	3
GENG 307	Material Science	3	EE 302	Entrepreneurship Education II	
EE-301	Entrepreneurship Education I				
	TOTAL	20			15

**Fourth Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
GENG 403	Engineering Management I	3	CENG 404	Engineering Management II	3
CENG 405	Soil Mechanics	3	CENG 406	Geotechnical Engineering	3
CENG 401	Structural Analysis & Design I	3	CENG 402	Structural Analysis and Design II	3
CENG 407	CE Fluid Mechanics	3	CENG 408	Intro to Thermodynamics	3
CENG 403	Quantity Surveying	3	CENG 410	Civil Engineering Lab II	1
CENG 409	Civil Engineering Lab I	1	GENG-408	Engineering Economics	3
			GENG-412	Research Methodology	1
	<b>TOTAL</b>	<b>16</b>			<b>17</b>

**Summer Internship**

Course Code	Course Title	Credit Hr.
<b>GENG-400</b>	Internship	<b>1</b>
<b>TOTAL</b>		<b>1</b>

**Fifth Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
Course No.	Course Title	Credit	Course No.	Course Title	Credit
CENG 501	Structural Analysis & Design III (Reinforced Concrete)	3	CENG 502	Structural Analysis & Design IV (Steel Design)	3
CENG 503	Highway Engineering I	3	CENG 505	Highway Engineering II	3
CENG 507	Environmental / Sanitary I (Water Management)	4	CENG 508	Environmental/Sanitary II (Waste Management)	1
CENG 505	Civil Engineering Project Design	3	CENG 510	Seminar	1
<b>Total</b>		<b>13</b>	<b>Total</b>		<b>8</b>
<b>Cumulative Minimum Credits Required for Graduation</b>					<b>167</b>

## *Bachelor of Science in Mechanical Engineering*

### **Program Description**

The Mechanical Engineering Program is designed to provide the educational requisites in the training of men and women for the degree of Bachelor of Science in Mechanical Engineering. Like any other engineering program, the coursework is based on science and technology. The learning objectives are also grounded on mathematical solutions, logic, principles of analysis and experiential learning for creativity. The Program combines a broad-based education in the engineering sciences with a strong grounding in qualitative problem-solving, design, engineering management and communications skills. It prepares students for a broad range of careers associated with the design and implementation of mechanical systems in a wide variety of fields including medicine, aerospace, automotive, energy systems. Among the courses that provide breadth in the discipline are included: design, dynamics, engineering materials, thermodynamics, fluid mechanics, heat transfer, systems analysis and design, and associated laboratories.

### **Program Objectives**

- To train engineers knowledgeable of mechanical engineering designs and the complexity of machines;
- To develop competent engineers with the ability to recognize problems and to design solutions to problems pertaining to construction, manufacture, and various other requirements of mechanical engineering;
- To prepare engineers who are cognizant of their professional, ethical, social-economic and global responsibility to society and the environment as a whole.

### **Student Learning Outcomes**

Students will be able to:

- Demonstrate knowledge of the mathematical and scientific foundation of Mechanical Engineering;
- Demonstrate knowledge and ability to design and construct various mechanical systems in keeping with established standards and specifications;
- Calculate for and build various machine parts;
- Understand the importance of engineering ethics, environmental safety, entrepreneurship and professionalism;
- Demonstrate all of the above knowledge by sitting and successfully passing a professional qualifying exam.

## *Bachelor of Science in Mechanical Engineering*

### *First Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG I02	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 106	Intro to Engineering Analysis and Design	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	Total	21		Total	20

### *Second Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3			
MATH 201	Differential Calculus	3	PHY 202	Physics for Engineers II	4
PHY 201	Physics for Engineers I	4	MATH202	Integral Calculus	3
GENG 203	Introduction to Engineering Drawing II	1	MATH 206	Intro to Linear algebra	3
EVS 201	Introduction to Environmental Science	3	GENG 202	Engineering Graphics/ CAD I	3
	TOTAL	20			19

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
MATH 301	Multivariable Calculus	3	MATH 302	Ordinary Differential Equations (ODE)	3
GENG 301	Engineering Mechanics I (Statics)	3	EE 302	Entrepreneurship Education II	0
GENG 305	Computer Programming (MATLAB)	3	GENG 306	Electrical Fundamentals	3
GENG 307	Material Science	3	GENG 304	Engineering Mechanics II (Dynamics)	3
EE 301	Entrepreneurship Education I	0	GENG 308	Strength Of Materials	3
MENG 301	ME Basic Practical Workshop	1	MENG 302	Kinematics of Machine	3
GENG 302	AutoCAD II (3D Modeling)	3	MENG 308	ME Basic Practical Workshop II	1
	TOTAL	16			16

**Fourth Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
MENG 401	Engineering Thermodynamics	3	MENG 402	Heat Transfer	3
GENG 403	Engineering Management I	3	MENG 404	Fluid Mechanics II	3
MENG 403	Fluid Mechanics I	3	MENG 406	Applied Thermodynamics	3
MENG 405	Dynamic Systems	3	MENG 408	System Dynamics and Control	3
MENG 407	Mechanical Lab / Workshop I	1	GENG 408	Engineering Economics	3
MENG 409	Manufacturing Processes	3	MENG 410	Mechanical Lab / Workshop II	1
MENG 411	Machine Design I	3	GENG 412	Research Methodology	1
	TOTAL	19			17

**Summer Internship**

Course Code	Course Title	Credit Hr.
GENG-400	Internship	1
TOTAL		1

**Fifth Year**

<b>Semester I</b>			<b>Semester II</b>		
<b>Course No.</b>	<b>Course Title</b>	<b>Credit</b>	<b>Course No.</b>	<b>Course Title</b>	<b>Credit</b>
MENG 501	Computer Aided Design / Manufacturing (CAD /CAM)	3	MENG 500	ME Seminar	1
MENG 505	Mechanical Engineering Project Design	4	MENG 504	Fluid Power System	3
MENG 509	Machine Design II (Analysis and Design of Machine Components)	3	MENG 506	Production Management	3
MENG 511	Internal Combustion Engine & Automotive Power Systems	3	MENG XXX	Technical Elective II	3
MENG XXX	Technical Elective I	3			
	<b>TOTAL</b>	16			10
<b>Cumulative Minimum Credits Required for Graduation</b>					<b>171</b>

**Technical Electives:****First Semester**

<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hrs.</b>
MENG 503	Alternative Energy Systems	3
MENG 507	Finite Element Method	3

**Second Semester**

<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hrs.</b>
MENG 508	Heating, Ventilation and Air Conditioning System	3
MENG 510	Modeling, Simulation and Control of mechanical system	3

**Graduation Requirement for B.Sc. Degree in Engineering for Mechanical Engineering Students is 171 credit hours.**

## *Bachelor of Science in Renewable Energy Engineering*

### *Program Description*

The Renewable Energy Engineering Program is designed to provide the educational requisites in the training of men and women for the degree of Bachelor of Science in Renewable Energy Engineering. The coursework provides students analytical and hands-on skills in designing, building, operating and enhancing sustainable energy systems with the combination of energy generation, distribution and utilization within environment. In addition, it also provides the use of best technologies such as solar thermal systems, photovoltaic, wind, and biomass. At the same time, faculty and students will engage in applied research in emerging technologies and provide professional services to their communities. It is a five year and unique program in engineering and started to become popular. The program does not only prepare graduates for professional practice but it also motivates the students to pursue graduate studies.

### *Program Objectives*

- To develop **competent engineers** who are able to recognize and design solutions in the fields of energy engineering.
- To train engineers in critical thinking, problem solving, and effective communication.
- To prepare engineers who are **cognizant** of their professional, ethnical and socio- economic responsibility to society and the environment as a whole.

### *Student Learning Outcomes*

Students are able to:

- Demonstrate knowledge of the mathematical and scientific foundation of Renewable Engineering
- Ability to design and conduct experiments and analyse the data.
- Ability to function within a team and communicate effectively.
- Understand the importance of engineering ethics, environmental safety, entrepreneurship and professionalism
- Demonstrate all of the above knowledge by sitting and successfully passing a professional qualifying exam

*Curriculum Requirements Total Credits 163*

General Education - 52 Credits

Engineering Math/Science - 24 Credits

General Engineering Courses – 15 Credits  
Major - 56 Credits  
Conc/Technical Elective – 16 Credits

*Core Requirements*

- Mathematics, physics, and chemistry
- Social Sciences, environmental science & safety
- Utilization of Electrical Power, Special Electrical Machines, Biofuels and Biomass Technology, Wind Energy Technology

*Concentration Options*

- Industrial and Maintenance Engineering, Senior Design Project, Industrial Electronics, Hydropower Technology,
- Internship

*Cognate Requirements*

- Principles of engineering analysis
- Algebra, Geometry, Trigonometry, and Calculus
- Engineering graphics and structural designs
- Strength and properties of materials
- Design of civil structures and buildings



## *Bachelor of Science on Renewable Energy Engineering*

### *First Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG 102	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 106	Intro to Engineering Analysis and Design	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	TOTAL	21			20

### *Second Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3			
MATH 201	Differential Calculus	3	PHY 202	Physics for Engineers II	4
PHY 201	Physics for Engineers I	4	MATH202	Integral Calculus	3
GENG 203	Introduction to Engineering Drawing II	1	MATH 206	Intro to Linear algebra	3
EVS 201	Introduction to Environmental Science	3	GENG 202	Engineering Graphics/ CAD I	3
	TOTAL	20			19

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
Course No.	Course Title	Credit	Course No.	Course Title	Credit
REENG 301	Utilization of Electrical Power	3	REENG 302	Introduction to Renewable Energy Power Systems	3
REENG 303	Rural Electrical Energy System Planning and Design	3	REENG 304	Special Electrical Machines	3
EENG 301	Electrical Network I	3	EENG 302	Electrical Network II	3
MATH 301	Multivariable Calculus	3	MATH 302	Ordinary Differential Equations	3
GENG305	Computer Programming (MATLAB)	3	GENG 306	Electrical Fundamentals	3
EE 301	Entrepreneurship Education I		EE 302	Entrepreneurship Education II	
	TOTAL	15			15

**Fourth Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
REENG 401	Biofuels and Biomass Technology	3	REENG 402	Energy Modeling and GHG Emission Analysis	3
REENG 403	Solar Energy Technology	3	REENG 404	Wind Energy Technology	3
REENG 405	Energy Management and Environmental Impact	3	REENG 406	Power Electronics	3
REENG 407	REENG Practical Workshop II	1	REENG 408	Engineering Economics for Renewable Energy Systems	3
REENG 409	High Voltage Engineering	3	REENG 410	Power Generation and Hybrid Systems	3
EENG 401	Electronics I	3	EENG 402	Electronics II	3
EENG 407	Control Systems	3	GENG-412	Research Methodology	1
	TOTAL	19			19

**Summer Internship**

Course Code	Course Title	Credit Hours
GENG – 400	Internship	1
TOTAL		1

***Fifth Year***

Semester I			Semester II		
<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
Course No.	Course Title	Credit	Course No.	Course Title	Credit
REENG 501	Industrial and Maintenance Engineering	3	REENG 502	Hydropower Technology	3
REENG 503	Industrial Electronics	4	REENG 504	Instrumentation	3
REENG 503	Renewable Energy Engineering Project Design	3	REENG 506	REENG Seminar	1
	<b>TOTAL</b>	<b>19</b>			<b>19</b>

## ***Bachelor of Science in Computer Networks and Security Engineering***

### *Program Description*

The Computer Networks and Security Engineering Program are designed to provide the educational requisites in the training of men and women for the degree in Bachelor of Science in Computer Networks and Security Engineering. The courseware focuses in variety of aspects such as communication, network design, and security that will prepare the students to work in the area of network supports wherein the demand is increasing and offers excellent salaries. In addition, the program will assist the students on how to achieve industry certification such as A+, Microsoft, Cisco, etc. that will strengthen their credentials and competencies in the field of networking. It is a five year program with a strong foundation in both theory and practical aspects in the area of networking and security engineering. Graduates can work as a network administrators, network designers, network engineers, computer security experts, etc. In the near future, the program will also cater a post graduate program.

### *Program Objectives*

- To produce a high caliber network engineers that will focus on leading a research, designing, developing, and maintaining projects in different areas of networking
- To practice network professionals ethical and collective aspects dealing with development, design, and usage in networking aspects,, and
- To enhance and update their skills in modern network technologies by engaging in a post graduate degree or equivalent training.

### *Student Learning Outcomes*

Students are able to:

- Apply and demonstrate computer hardware and software in terms of installing, troubleshooting.
- Manage home and small business computer network systems.
- Learn and use suitable IP addressing scheme, hardware, software, design, troubleshoots, and maintenance of computer network infrastructure within a small and medium size organizations.
- Identify different computer network security threats and susceptibilities within a given network.
- Indicate a suitable network security hardware and software within a given security requirements and apply the necessary security capacities to mitigate the risks associated with computer network.

### *Curriculum Requirements Total Credits 164*

General Education - 52 Credits

Engineering Math/Science -23 Credits

General Engineering Courses – 15 Credits  
Major - 67 Credits  
Concentration -7 Credits

*Core Requirements*

- Mathematics, Science, Engineering
- Introduction to Cyber Security Engineering, Internetworking Technologies, Network Building, and Network Security, Introduction to Java, Intro to Operating Systems, Web Programming and Development
- Advanced Java Programming, Security Architecture and Managing Security Solution, Cloud Computing, Artificial Intelligence, Firewall and Applications
- Internet Law and Policy, Network Threat Protection, Embedded System Design, Advance, Advance Operating Systems, Cyber Security Law and Policy
- Bandwidth Management, Ethical Hacking, Legal Issues and Global Regulation

*Concentration Options*

- Software Engineering Comprehensive Practice, Senior System Design Project, Digital Forensics Within a Justice System
- Internship/Coop

*Cognate Requirements*

- Network Threat Protection
- Computer Forensics
- System Design Practices in Computer Science

*Eligibility for Internship*

- Completion of at least 103 credit hours of courses including one's major courses.
- Submission of the required internship application and receipt of employment notification

## *Bachelor of Science in Computer Networks and Security Engineering*

### *First Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG I02	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 106	Intro to Engineering Analysis and Design	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	TOTAL	21			20

### *Second Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3			
MATH 201	Differential Calculus	3	PHY 202	Physics for Engineers II	4
PHY 201	Physics for Engineers I	4	MATH202	Integral Calculus	3
GENG 203	Introduction to Engineering Drawing II	1	MATH 206	Intro to Linear algebra	3
EVS 201	Introduction to Environmental Science	3	GENG 202	Engineering Graphics/ CAD I	3
	TOTAL	20			19

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
CSENG 301	Intro to Cyber Security Engineering	2	CSENG 302	Web Programming and Development	3
CSENG 303	Internetworking Technologies, Network Building and Network Security	3	CSENG 304	Advanced Java Programming	3
CSENG305	Intro to Operating Systems	3	CSENG 306	Security Architecture and Managing Security Solution	3
CSENG 307	Introduction to Java	3	CSENG 308	Cloud Computing	3
CSENG 309	System Design Practices in Computer Science	3	MATH 302	Ordinary Differential Equations	3
MATH 301	Multivariable Calculus	3	EE 302	Entrepreneurship Education II	0
EE 301	Entrepreneurship Education I	0			
	TOTAL	17			15

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
CSENG 401	Artificial Intelligence	3	CNENG 402	VPN, Load Balancing and Failover	3
CNENG 403	Firewall and Firewall Applications	3	CSENG 404	Advance Operating Systems	3
CENG 405	Internet Law and Policy	3	CNENG 406	Cyber Security Law and Policy	3
CNENG 407	Network Threat Protection	3	CNENG 408	Computer Forensics	3
CSENG 409	Embedded System Design	3	GENG 408	Engineering Economics	3
GENG 403	Engineering Management I	3	GENG 404	Engineering Management II	3
			GENG 412	Research Methodology	
	TOTAL	18			19

**Summer Internship**

Course Code	Course Title	Credit Hours
GENG – 400	Internship	1
TOTAL		1

***Fifth Year***

Semester I			Semester II		
<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
CNENG 501	Bandwidth Management	3	CNENG 502	Ethical Hacking , Penetration Tests	3
CNENG 503	Digital Forensics Within a Justice System	3	CNENG 504	Legal issues and Global Regulation	3
CNENG 505	Cyber Network Engineering Project Design	4	CNENG 506	CSENG Seminar	1
	TOTAL	18			19
<b>Cumulative Minimum Credits Required For Graduation</b>					<b>163</b>



## ***Bachelor of Science in Computer Science and Engineering***

### ***Program Description***

The Computer Science and Engineering Program are designed to provide the educational requisites in the training of men and women for the degree in Bachelor of Science in Computer Science and Engineering. The courseware focuses on solving problems related to computers that produce each graduate a broad skill in both software and hardware specifically in computing systems. In addition, it is a self-motivated discipline across different fields in mathematics, science, and engineering that provides a foundation and dedicated knowledge that is needed to scrutinize, design, and gauge system software, and utility programs. This will also allow students to solve and develop a hardware and software solutions in different areas of application provided with different methodologies and techniques on how information is derived, stored, operated, and linked. Students will experience to gain access in different resources plus the real scenario approach on their hands-on exercises in the laboratory. BSc in Computer Science and Engineering is a five year program and considered as one of the exciting fields of study today due to rapid growth and changes in technology including a demand for a computing experts locally and internationally. At the same time, the students will be encouraged to take a variety of industry certification such as A+, Microsoft, Cisco, etc. to strengthen their credentials. In the near future, this program will also cater a post graduate degree.

### ***Program Objectives***

- To produce a high caliber computing professionals that will focus on leading a research, designing, developing, and maintaining projects in different areas of computing,
- To practice computing professionals ethical and collective aspects dealing with development, design, and usage of variety of computing pieces, and
- To enhance and update their skills in modern computing technologies by engaging in a post graduate degree or equivalent training.

### ***Student Learning Outcomes***

Students are able to:

- Apply and demonstrate knowledge and skills in computing, mathematics, science, and engineering to the discipline.
- Analyze, identify, design, implement, and evaluate computing based projects.
- Understand the professional, proper, lawful, safety, common issues, and accountabilities.
- Use modern approach, tools, and skills in computing and participate in professional development for continuous education.
- Apply mathematical fundamentals, algorithm philosophies, and computer science model in developing a project.

- Provide a variety of hardware and software systems and analyze the global impact of computing in individuals.

*Curriculum Requirements Total Credits 167*

General Education - 52 Credits  
 Engineering Math/Science -23 Credits  
 General Engineering Courses – 15 Credits  
 Major - 72 Credits  
 Concentration -5 Credits

*Core Requirements*

- Mathematics, Science, Engineering
- Introduction to Computer Science and Engineering, Java Programming, Intro to Operating Systems, Web Programming and Development
- Advanced Java Programming, Introduction to Software Engineering, Introduction to Databases, Artificial Intelligence,
- Algorithm Analysis and Design, Relational Database Management System, Embedded System Design
- Data Communications and Networking I and II

*Concentration Options*

- Software Engineering Comprehensive Practice, Senior System Design Project
- Internship/Coop

*Cognate Requirements*

- Advanced Operating System, Digital Computer Circuits
- System Design Practices in Computer Science,
- Digital Signal and Image Processing
- Network Principles and Computer Security, Digital Hardware Design, Compiler Design

*Eligibility for Internship*

- Completion of at least 103 credit hours of courses including one's major courses.
- Submission of the required internship application and receipt of employment notification

## *Bachelor of Science in Computer Science and Engineering*

### *First Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 101	Grammar and Phonetics	3	ENG 102	Academic Reading and Writing	3
MATH 101	College Algebra	3	MATH 102	Analytical Geometry and Trigonometry	3
CHEM 101	Principles of Chemistry	4	BIO 101	General Biology	4
PHY 101	General Physics	4	PHI 101	Introduction to Philosophy	3
PSY 101	Introduction to Psychology	3	GENG 106	Intro to Engineering Analysis and Design	3
CSE 101	Introduction to Computer	3	CSE 102	Computer Literacy	3
PED 101	Physical Fitness and Wellness I	1	PED 102	Physical Fitness and Wellness II	1
	TOTAL	21			20

### *Second Year*

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
ENG 201	Technical Communication and Public Speaking	3	ENG 204	Introduction to Literature	3
FRE 101/ GLE 101 CHN 101	Introduction to French or Introduction to Glebo Introduction to Chinese	3	FRE 102/ GLE 102 CHN 102	Intermediate French Advanced Glebo Advanced Chinese	3
HIST 102	World History and Western Civilization	3	PHY 202	Physics for Engineers II	4
MATH 201	Differential Calculus	3	MATH202	Integral Calculus	3
PHY 201	Physics for Engineers I	4	MATH 206	Intro to Linear algebra	3
GENG 203	Introduction to Engineering Drawing II	1	GENG 202	Engineering Graphics/ CAD I	3
EVS 201	Introduction to Environmental Science	3			
	TOTAL	20			19

\*Qualifying exam must be passed for student to pursue junior year courses

**Third Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
CSENG 301	Introduction to Computer Science and Engineering	3	CSENG 302	Web Programming and Development	3
CSENG 303	File Organization and Processing	3	CSENG 304	Advanced Java Programming	3
CSENG 305	Introduction to Operating Systems	3	CSENG 306	Computer Science Professional Ethics	3
CSENG 307	Introduction to Java Programming	3	CSENG 308	Introduction to Software Engineering	3
CSENG 309	System Design Practices in Computer Science	3	CSENG 310	Introduction to Databases	3
MATH 301	Multivariable Calculus	3	MATH-302	Ordinary Differential Equations	3
EE-301	Entrepreneurship Education I		EE-302	Entrepreneurship Education II	
	TOTAL	18			18

**Fourth Year**

Semester I			Semester II		
Course Code	Course Title	Credit Hours	Course Code	Course Title	Credit Hours
CSENG 401	Artificial Intelligence	3	CSENG 402	Software Engineering Comprehensive Practice	3
CSENG 403	Algorithm Analysis and Design	3	CSENG 404	Advanced Operating System	3
CSENG 405	Principles of Programming Languages	3	CSENG 406	Digital Computer Circuits	3
CSENG 407	Relational Database Management System	3	CSENG 408	Data Communications and Networking 1	3
CSENG 409	Embedded System Design	3	CSENG 410	Network Principles and Computer Security	3
GENG 403	Engineering Management I	3	GENG-408	Engineering Economics	3
			GENG 412	Research Methodology	1
	TOTAL	18			19

**Summer Internship**

Course Code	Course Title	Credit Hours
GENG – 400	Internship	1
TOTAL		1

***Fifth Year***

Semester I			Semester II		
<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
CSENG 501	Digital Signal and Image Processing	3	CSENG 502	Data Communications and Networking 2	3
CSENG 503	Digital Hardware Design	3	CSENG 504	Compiler Design	3
CSENG 505	Computer Science Engineering System/ Project Design	4	CSENG 506	CSE Seminar	1
	TOTAL	10			7
<b>Cumulative Minimum Credits Required for Graduation</b>					<b>167</b>