

## About FENC

In 1998 the University of Technology, Jamaica (UTech) was reorganized into five Faculties. Emerging from the rationalization of the university's academic and administrative units, the Faculty of Engineering and Computing (FENC) became an entity. FENC comprises the following schools:

- School of Engineering
- School of Computing and Information Technology

FENC is the second largest such faculty in the Caribbean region and it is also the second largest faculty within UTech.

### Vision Statement

To be the preferred partner in providing education and training for engineering and computing scholarship in Jamaica and the Caribbean.

### Mission Statement

Build an education and training framework that responds to local and regional needs by:

- Promoting excellence in staff, students and graduates.
- Emphasizing quality in teaching and research.
- Developing relevant curricula based on student-centred learning concepts.
- Fostering innovative use of technology in teaching methods and laboratory exercises.

- Maintaining a strong commitment to research, service and teamwork.
- Developing applied research projects for industrial renewal.
- Building collaboration with engineering and computing training institutions locally and internationally.



## Contact

### Student Affairs Office

Faculty of Engineering & Computing

University of Technology, Jamaica

237 Old Hope Road, Kingston 6

Phone: (876)-927-1680-8, Exts. 2163-2165

## Application & Registration

1. Applications should be made on the prescribed form, which is available at the Student Affairs Office.
2. Course Participants are encouraged to register in advance by completing and submitting the application form
3. Final Payments should be made at least **two weeks** before commencement of the course. Payments are accepted in Cash, Debit/Credit Cards, or Manager's Cheques.

## Cancellation

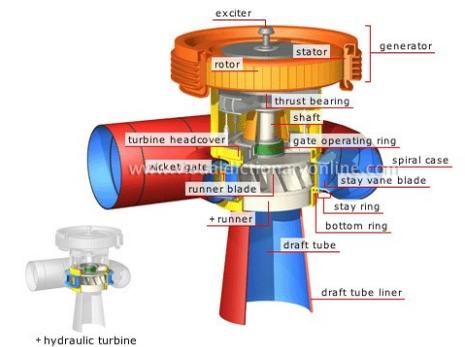
1. Courses may be cancelled where enrolment is insufficient, in which case, a refund of course fees will be made.
2. Student cancellation must be received one (1) week prior to the commencement of the course, failing which the individual or sponsor will be held responsible for the payment of fees.



University of Technology,  
Jamaica

## Faculty of Engineering & Computing

## Basic Stand-by Generator Maintenance



**"Solution Driven, Development Bound"**

## OBJECTIVE

This course is designed to provide participants with specific skills and knowledge of stand-by generator systems and applications in industry. The course refers to a typical stand-by generator system, applicable to a wide range of users and includes: general system safety, standards, schematic drawings, alternator connection, basic maintenance, installation overview and general system care.

## PREREQUISITE

Three passes at CXC General Proficiency with grades at 1&11 (Grade 3 as of 1998) or at GCE 'O' Level, with grades at A, B or C. Compulsory subjects are English Language and Mathematics.

## OR

1 year relevant work experience.)

## COURSE OUTLINE

The points listed under each unit represent competencies of the participant upon completion of the unit

### UNIT I: The Generator System (8 Hours)

- Review basic electrical principles applied to electrical generators
- Describe the four sections of a generator system
- Explain the principle of operation of the system and safety considerations
- Explain the functions of each of the four sections that comprise the generator system.
- Explain the technical terminologies used to classify a generator set.
- Outline the environmental impact of the

generator set

- Describe system grounding and over-current protection.
- Identify suitable locations to place generator set

### UNIT II: The Engine (11 hours)

- Describe two stroke and four stroke engines
- Describe how a diesel engine works and differentiate from gasoline engines
- Explain the difference between high speed, medium speed and low speed engines
- Describe fuel injection: mechanical and electronic
- Describe fuel delivery using mechanical or electronic governor
- Describe the major advantages of a diesel engine
- Describe the quality and variety of fuels including characteristics
- Select the correct battery size for engines (Lab)
- Connect the battery to engine starter (Lab)
- Dismantle an engine starter and identify its parts and their function (Lab)

### UNIT III: The Generator Set (8 Hours)

- Size generator set using data from name plate and load demand
- Identify different types of generator set noises, airborne and structure-borne
- Review methods to reduce generator set noise using acoustic materials and dampers
- Analyze a proper ventilation system for generator set room construction

- Perform maintenance to generator set (Lab)
- Understand the basic preventative maintenance of generators on a daily, weekly, monthly, semi-annually and annual basis.

### UNIT IV : The Transfer Switch (8 Hours)

- Adopt safe working practices when working on transfer switches including hot spot awareness
- Describe the two main types of automatic transfer switches
- Describe the operation/application of automatic transfer switches
- Review the principle of operation of relays and switches
- Describe the purpose of the:
  - time delay to start relay
  - time delay to transfer relay
  - time delay to retransfer relay
  - time delay to stop
- Explain the purpose of auxiliary switch (Lab)
- Explain two start generator set (Lab)
- Draw function diagram of a transfer switch (Lab)
- Basic servicing of a transfer switch (Lab)

### UNIT V: The Alternator (12 Hours)

- Define AC generators
- Define excitation systems
- Explain the function of voltage regulator
  - State the relationship between voltage regulator and the exciter field
- Differentiate between self and separate excitation alternator
- Identify and Explain the function of rotating diodes

- Identify main stator and rotor
- Identify exciter rotor and stator
- Identify permanent magnet rotor and stator
- Explain star, delta and star-delta connections on alternator output wiring
- Define technical terminologies such as:
  - AC generator
  - apparent power
  - true and reactive power
  - ampacity
  - bus-bars and contactors, etc.

## BREAKDOWN OF HOURS

Lectures/Discussion	30 hours
Laboratory	17 hours
Assessment	3 hours
<b>TOTAL COURSE HOURS:</b>	<b>50</b>

## INSTRUCTIONAL/LEARNING

### APPROACHES

Lecture, handouts, class activities and lab-work.

## ASSESSMENT PROCEDURES

1	Assignments	25%
2	In-class Test	50%
3	Laboratory	20%
4	Attendance	5%
	<b>TOTAL</b>	<b>100%</b>

## AWARD

On successful completion of the course, that is, where a student gains a mark of 60% or above, the individual will be awarded a "Certificate of Competence."