This programme is designed to produce industry-ready graduates with the necessary skills and knowledge to solve problems within the manufacturing, public utilities and other associated industries.

The programme focuses on the major areas of industrial systems engineering with the depth and rigour which will allow students to solve novel problems in the areas and to pursue research in engineering and in other scholastic works.

Upon completion of this programme, students will be able to assess user requirements and manage the acquisition and implementation of the various components needed to effectively solve any industrial problem.
MASTERS OF ENGINEERING (B.ENG.)
DEGREE IN INDUSTRIAL SYSTEMS

COURSE DESCRIPTION
Industrial automation is the central theme of the programme. It integrates the use of computer technology and advanced manufacturing techniques in the design and implementation of industrial systems. The design and use of industrial robots are introduced and this is combined with advanced control engineering techniques to produce automated industrial systems.

TARGET GROUP
Candidates with a first degree in industrial, mechanical, electrical, electronic or chemical engineering. Persons with an applied physics degree will be accepted on a case by case basis.

COURSE DURATION
The duration of the Masters Degree is a minimum of twelve (12) months, full time, and eighteen (18) months part time. Graduate students are required to earn sixty (60) credits as follows:
- 44 credits from 12 taught courses.
- 16 credits from a 15,000 word thesis on a chosen area in industrial engineering.

COURSE CONTENT
- Advanced Engineering Mathematics (3 credits)
- Computer Programming (4 credits)
- Advanced Manufacturing Processes (4 credits)
- Electrical Machines and Power Systems (4 credits)
- Mechanical Systems Design Principles (4 credits)
- Classical Mechanics (3 credits)
- Industrial Electronics (4 credits)
- Industrial Automation (4 credits)
- Microcontrollers and PLC’s (4 credits)
- Advanced Control (4 credits)
- Design and Management of Waste Water Treatment Systems (3 credits)
- Project Economics and Finance (3 credits)

RESEARCH PROJECT
Students are required to complete a research project in the final year. This project values 16 credits. Students will be required to identify a research topic based on a local need and design and fabricate a device to solve the problem. They will also submit a final paper with the device.

COURSE CONTENT

SCIENCE
- Mathematics I
- Mathematics II
- Mathematics III
- Ind’l Engineering Chemistry A
- Ind’l Engineering Chemistry B
- Mechanical Engineering Science

ENGINEERING
- Electrical Engineering
- Science
- Engineering Drawing and Designs I
- Engineering Drawing and Designs II
- Workshop Processes and Practice
- Workshop Technology
- Electrical Machines I
- Electrical Machines II
- Welding
- Materials Technology
- Electronics Principles
- Fuel Technology
- Fluid Mechanics
- Mobilization of Fluids
- Diesel Plant Principles
- Diesel Plant Operations
- Principles of A/C and Refrigeration
- Industrial Boiler Operations
- Instrumentation and Controls I
- Production Systems
- Principles of Thermodynamics

MANAGEMENT
- Communication Skills I
- Communication Skills II
- Engineering Ethics
- Introduction to Management

INDUSTRY AWARENESS
This will be undertaken over an 8-week period during the final summer.

AWARD
On successful completion of this programme, candidates will be awarded an Associate of Applied Science Degree.
COURSE DURATION

Full time: 2 years (4 semesters)
Part-time: 2 years (4 semesters and 2 summers)

ENTRY REQUIREMENTS

At least five (5) GCE O' Level or CXC subjects (Mathematics, English and three other subjects, which must include two science subjects)

COURSE CONTENT

SCIENCE
• Engineering Mathematics I, II and III
• Probability and Statistics
• Research Methods
• Occupational Health and Safety

CORE ENGINEERING
• Control Engineering and Instrumentation
• Industrial Electronics
• Computer Architecture and Programming
• Designs, Materials and Processes
• Energy and Fluid Flow
• Computer Programming
• Energy Conversion Systems
• Renewable Energy
• Computer Aided Design and Manufacturing
• Manufacturing Processes I and II
• Strength of Materials and Structures
• Industrial Systems and Material Handling
• Dynamics, Noise and Vibration
• Microcontroller Applications

CORE MANAGEMENT
• Management for Engineers
• Labour and Employment Law
• Operations Management

To achieve the Bachelors of Engineering in Industrial Systems, candidates must successfully complete all core courses and a ten (10) credit dissertation.

FINAL PROJECT

The final project will offer the opportunity:
• For independent learning to either broaden or deepen understanding of a subject area related to the subject matter of the award.
• To develop the ability to apply technical knowledge in the solution of an extended problem, constrained by realistic contextual factors.
• To undertake an extended piece of work developing the use of research skills and time management.

DURATION

Full Time: Two years (4 semesters)
Part Time: Two years (4 semesters and 2 Summers)
ASSOCIATE OF APPLIED SCIENCE DEGREE IN INDUSTRIAL SYSTEMS, OPERATIONS AND MAINTENANCE (AASC. ISOM)

The Industrial Systems Operations and Maintenance programme is designed to equip participants with the requisite skills and knowledge for the safe and economical operation of most of the machinery and equipment used in industrial plants and facilities requiring heating, air-conditioning and electrical power generation. Graduates of this programme will be at an engineering technician level with sound theoretical background to understand and identify equipment faults and make recommendations. They will also be able to supervise personnel in the operation and maintenance of industrial equipment.

OBJECTIVES

To equip candidates with the skills of maintenance and operation of machinery and equipment in industry with the requisite skills of planning and implementing systems control.

PROGRAMME DELIVERY MODE

Part-Time Day Release: One full day and one evening over six (6) semesters at fifteen (15) weeks per semester and three (3) summers.

Full-time: Five (5) days per week for four (4) semesters at fifteen (15) weeks per semester and two (2) summers. The final summer will be spent on work experience.

ENTRY REQUIREMENTS

At least five (5) GCE O’ Level or CXC subjects (Mathematics, English and three other subjects, which must include two science subjects)

OR

At least four years related industrial experience with at least GCE or CXC passes in Mathematics, English and Physics/Mechanical Engineering Science. In the event the prospective candidate does not have English, he/she will be required to sit and pass an English entrance test set by the Institute.

OR

Course exemption from other marine officer’s programme and other Institutions to be assessed and awarded.

COURSE DURATION

Full-Time: Two years (4 Semesters and 2 Summers)
Part-Time: Three years (6 Semesters and 3 summers)

MODES OF INSTRUCTION

In order to make the programme interesting, a variety of methods will be used to facilitate teaching and learning with the purpose of accommodating the learning styles of the diverse population of candidates. These will include:

- Seminars
- Student presentations
- Guest speakers
- Case studies
- Field trips
- Role playing
- Audio-visual presentations
- Active class discussion and debates
- Team teaching
- Quizzes
- Panel discussion

METHODS OF EVALUATION

These will be both formative and summative and will employ the following:

- Assignments
- Presentations
- Quizzes
- Projects (individual and group)
- Group discussions
- Examinations

BACHELORS OF ENGINEERING (B.ENG.) DEGREE IN INDUSTRIAL SYSTEMS

This degree is designed to produce a well-rounded graduate with the engineering knowledge and skills combined with management education that will adequately prepare him/her for contributing towards the process of technical implementation and innovation within the manufacturing industry.

COURSE PHILOSOPHY AND RATIONALE

This course of study is designed to take advantage of computer-aided engineering tools and management systems available to educate and train a multi-disciplinary engineer. Such a person will have knowledge of industrial systems, design and implementation, together with other traditional fields of engineering that are associated with manufacturing, but will have an investigative approach to problem solving.

TARGET GROUP

This degree programme is designed to produce graduates with effective engineering skills of a broad nature. It will meet the training needs of personnel from the following industries both nationally and regionally:

- Public Utilities: Power generation, Water distribution and Hospitals
- Manufacturing: Clothing, Fabrication and Light industry
- Process: Bauxite, Cement, Sugar and Petro-chemicals
- Ancillary: Transport and Shipping, Agricultural and Refrigeration
- Commercial: Property Management, Tourism and Printing