

The background of the image is a light gray, semi-transparent collage of technical drawings. It features various gears of different sizes, some with teeth and others as simple circles. There are also lines, arrows, and other mechanical symbols scattered throughout, creating a sense of engineering and industry. The overall aesthetic is clean and professional.

ENGINEERING

A Career of Human Significance

The background features a light gray, semi-transparent graphic of various mechanical gears and arrows of different sizes and orientations, scattered across the page. The gears are of various sizes and some have teeth, while the arrows are simple line drawings pointing in different directions. The overall aesthetic is technical and industrial.

WHAT IS ENGINEERING?

ENGINEERING is a science-based profession by which the natural forces of nature (e.g. gravity, sunlight, wind, oceans and rivers) and the properties of materials are made useful to mankind in the form of structures, machines, gadgets and products or processes.



THE ENGINEER

An ENGINEER is a person who is constantly creating and innovating and is trained or skilled in designing, planning and implementation of such apparatuses as machines, devices and structures and in supervising their implementation.

ENGINEERING DISCIPLINES

Engineering disciplines cover a wide range of ever-expanding activities in the sphere of science and technology. These include the following:

- ❖ AERONAUTICAL ENGINEERING
- ❖ BIOMEDICAL ENGINEERING
- ❖ CHEMICAL and PROCESS ENGINEERING
- ❖ CIVIL AND ENVIRONMENTAL ENGINEERING
- ❖ ELECTRICAL ENGINEERING
- ❖ GEOLOGICAL and MINING ENGINEERING
- ❖ INDUSTRIAL and MANAGEMENT ENGINEERING
- ❖ MATERIALS and METALLURGICAL ENGINEERING
- ❖ MECHANICAL ENGINEERING
- ❖ MARINE ENGINEERING
- ❖ NUCLEAR ENGINEERING



What it takes to be an Engineer?

- **Courage, integrity, responsibility, accountability**
- **Thirst for KNOWLEDGE**
- **Imagination**
- **Sound judgment**
- **Accuracy of thought and action**
- **Instinct for economy**
- **Habit of thinking back from Effects to their Causes**
- **Aptitude for leadership**
- **Instinct for economy**
- **Ingeniousness and creativity**
- **Capacity for Hard Work**
- **Ability to think and speak lucidly**



AERONAUTICAL ENGINEERING

Deals with the design, manufacture, maintenance, testing and use of aircraft for all purposes. Closely related is aerospace engineering which deals with the design and operation of spacecraft.

FIG.



BIOMEDICAL ENGINEERING

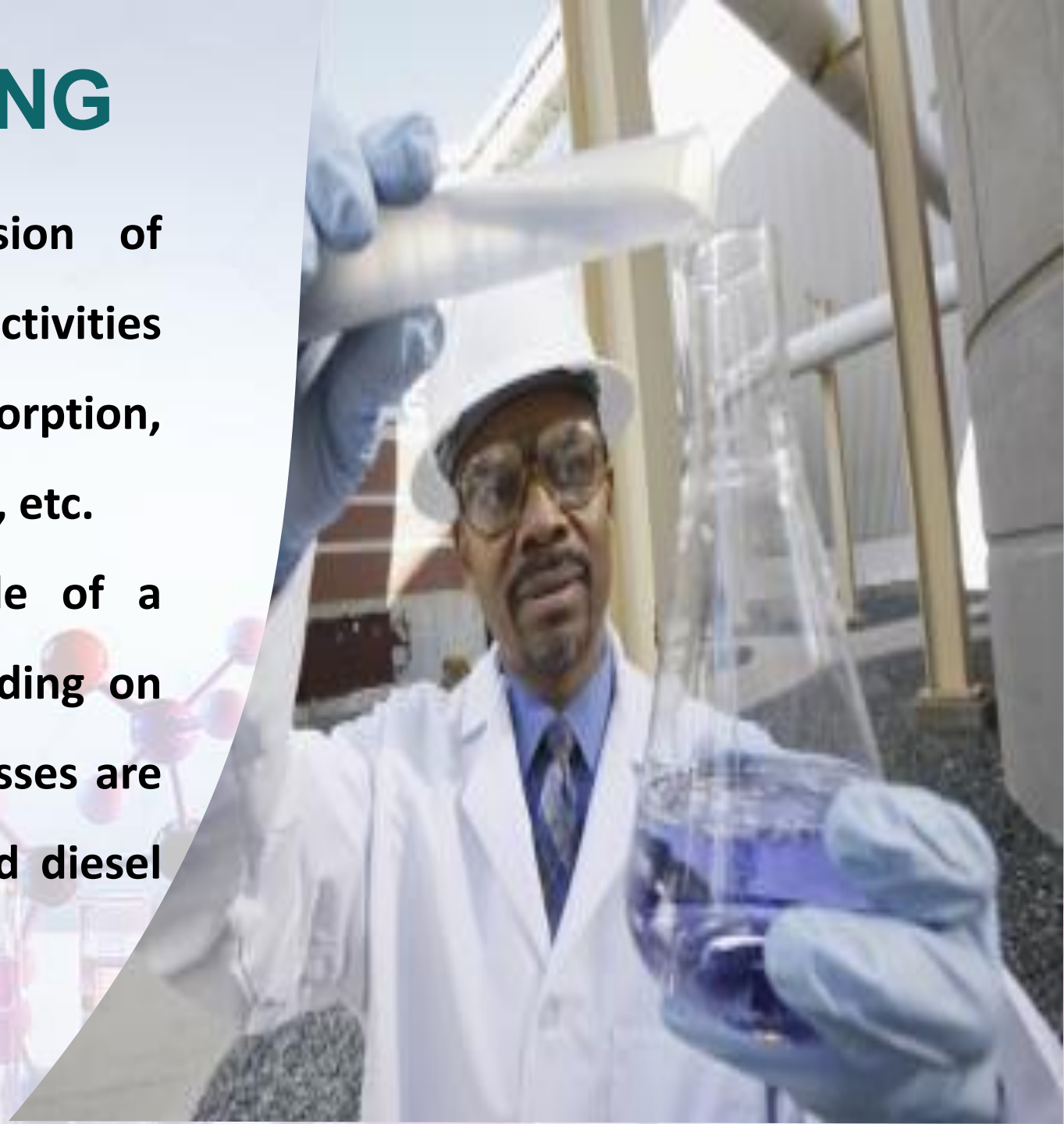
Combines engineering and medicine and deals with the design and construction of medical instruments, artificial limbs, artificial hearts and the advanced equipment used in a modern health facility.



CHEMICAL ENGINEERING

Deals with the production or conversion of chemicals for industrial use. This involves activities such as distillation, evaporation, absorption, humidification or drying, adsorption, mixing, etc.

A petroleum refinery is a good example of a chemical engineering achievement. Depending on the crude oil being refined, different processes are employed to produce gasoline, jet fuel and diesel oil.



CIVIL AND ENVIRONMENTAL ENGINEERING

Deals with the design and construction of the built environment. These include buildings and foundations, roads, highways, bridges, jetties, ports and other concrete and steel structures.

It also deals with water and wastewater collection and treatment, the erection of dams, drainage, flood control, irrigation, and water distribution systems, sewage disposal systems and environmental concerns such as coastal erosion and coastline protection systems.



ELECTRICAL ENGINEERING

This discipline began with the production, distribution and utilisation of electrical power. It also deals with the design and manufacture of generators, motors, transmission systems and their appropriate controls.

This discipline has been expanded to include the field of electronics, telecommunications, computer and software engineering





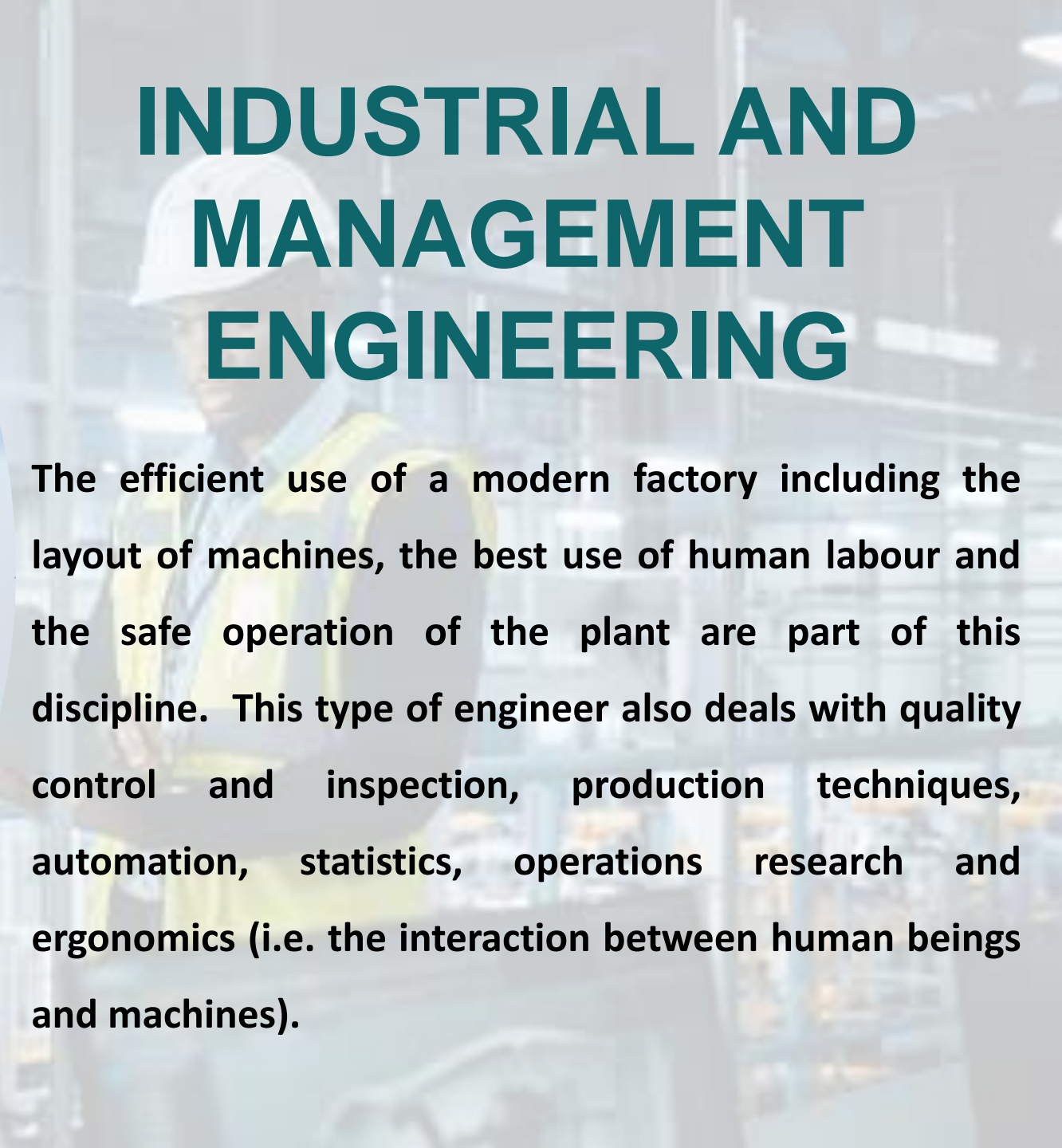
GEOLOGICAL & MINING ENGINEERING

This area deals with the discovery and exploration of mineral deposits, the various processes to extract these minerals and their conversion into useful metals or other refined products. Geology, rock mechanics, extraction processes and an understanding of the properties of ores and metals are also part of this discipline.



INDUSTRIAL AND MANAGEMENT ENGINEERING

The efficient use of a modern factory including the layout of machines, the best use of human labour and the safe operation of the plant are part of this discipline. This type of engineer also deals with quality control and inspection, production techniques, automation, statistics, operations research and ergonomics (i.e. the interaction between human beings and machines).





MATERIALS & METALLURGICAL ENGINEERING

This area covers the development of appropriate materials and alloys to meet various industrial needs as well as the development of plastics and other artificial materials.

MECHANICAL ENGINEERING

This area encompasses the design, construction and utilisation of machines and their components. This includes air conditioning, refrigeration and ventilation systems, automobile engines, gas turbines, power plants, factory layouts, etc.



MARINE ENGINEERING

This discipline deals with the design and testing of installations and repairs of marine apparatus, equipment and accessories on ships to ensure that the ship's systems function as per the design.



NUCLEAR ENGINEERING

This area deals with the safe design and operation of nuclear power plants for energy generation. Nuclear engineers are also concerned with shielding systems to safeguard people from the harmful effects of radiation.



WHAT IT TAKES TO BE AN ENGINEER

- **COURAGE, INTEGRITY, RESPONSIBILITY, ACCOUNTABILITY**
- **THIRST FOR KNOWLEDGE**
- **IMAGINATION**
- **CAPACITY FOR SOUND JUDGEMENT**
- **ACCURACY OF THOUGHT AND ACTION**
- **INSTINCT FOR ECONOMY**
- **HABIT OF THINKING BACK FROM EFFECTS TO THEIR CAUSES**
- **APTITUDE FOR LEADERSHIP**
- **INGENIOUSNESS**
- **CAPACITY FOR HARD WORK**
- **ABILITY TO THINK AND SPEAK LUCIDLY**

THE ROUNDED PERSONALITY

Apart from pursuing the technical courses that would eventually lead to an engineering degree, the engineer of today needs to have a well-rounded personality. A person embarking on an engineering career should have a wide knowledge of other fields beyond his immediate specialty.

Exposure to fundamentals of the following topics is most important:

- ❖ **BIOGRAPHIES** i.e. depict the lives of great men and women and their exploits.
- ❖ **TRAVEL** i.e. broadens one's scope and perspectives
- ❖ **HISTORY** i.e. relevance of rise and fall of great civilizations
- ❖ **ECONOMICS AND SOCIOLOGY** i.e. deals with people and money
- ❖ **PSYCHOLOGY** i.e. understanding of self and others
- ❖ **EMOTIONAL INTELLIGENCE** i.e. the capacity to handle interpersonal relationships judiciously and empathetically
- ❖ **PHILOSOPHY** i.e. ethics, aesthetics, logic, metaphysics and sources of wisdom

FUNCTIONS OF THE ENGINEER

Most engineers are employed in industry, government or as consultants.

The many different engineering functions include the following:

- ❖ RESEARCH & DEVELOPMENT**
- ❖ DESIGN AND TESTING**
- ❖ MANUFACTURING OR CONSTRUCTION**
- ❖ QUALITY CONTROL AND INSPECTION**
- ❖ SALES AND MARKETING**
- ❖ MAINTENANCE**
- ❖ MANAGEMENT**

ENGINEERING OPPORTUNITIES

The work of the engineer is seen in the following:

- ❖ **Transportation and communication systems**
- ❖ **Water supply and Sanitary systems**
- ❖ **Factories, tools, machines and production systems**
- ❖ **Electrical/electronic and computer systems**
- ❖ **Commercial, residential, institutional and sports buildings and complexes**
- ❖ **Agricultural and agro-industrial systems**
- ❖ **Other scientific systems like biomedical engineering, environmental engineering, geological engineering, aeronautical engineering, aerospace engineering, coastal and marine engineering, nuclear engineering, etc.**

PATHWAYS TO BECOMING A PROFESSIONAL ENGINEER

Route to an Accredited BSc in Engineering

1. Pursuit of a course of studies that integrates the areas of Science, Technology, Engineering and Mathematics (STEM) at CSEC level
2. University matriculation entry level qualification by means of CAPE or other qualifications in the subjects of Mathematics and Physics will allow direct entry into an accredited BSc Engineering Degree for most engineering fields of studies.
3. CAPE or equivalent qualification in Chemistry may be required in addition to mathematics and physics to enter the fields of Chemical and Process engineering.
4. CSEC and SAT (Scholastic Assessment Test) will allow admission to Universities in the USA and Canada to pursue an accredited Bachelor's Degree in Engineering.
5. Proficiency Level Grade in CSEC may facilitate pursuit of a Diploma in Engineering at UTT. However, this has to be followed by an accredited BSc. Engineering Degree

PATHWAYS TO BECOMING A PROFESSIONAL ENGINEER

Route to become a Registered / Licensed Professional Engineer

1. **An accredited BSc. Degree in Engineering**
2. **Evidence of further learning by way of studies or course credits equivalent to a Master's Degree or alternatively an accredited Master's Degree (need not necessarily be only in the field of Engineering)**
3. **Four years post-graduate experience in the practice of engineering**

A group of four construction professionals, two men and two women, are gathered around a table in a construction site. They are all wearing white hard hats and are focused on reviewing a set of blueprints spread out on the table. The background shows a blurred construction site with scaffolding and structural elements. The overall tone is professional and collaborative.

**THANK YOU
FOR YOUR ATTENTION**