Core Technologies

ITEA 2

Core Technologies

The Core Technologies are considered to be the "basic building blocks" from which all technology systems are created. They include:

(a) mechanical technology
(b) electrical technology
(c) electronic technology
(d) structural technology
(e) fluid technology
(f) optical technology
(g) thermal technology
(h) biotechnology
(i) materials technology

Core Technologies

Instruction on the Core Technologies will provide you with an understanding of:

(a) common components;

(b) basic systems design;

(c) simple controls;

(d) system performance evaluation;

(e) science concepts applied;

(f) mathematics applications to measure, analyze, describe and predict; and

(g) safety practices for interacting with technology systems

Core Technologies Produce Technology Systems

Derivation and Application of Technology Systems

TECHNOLOGY CAREER TEAMS

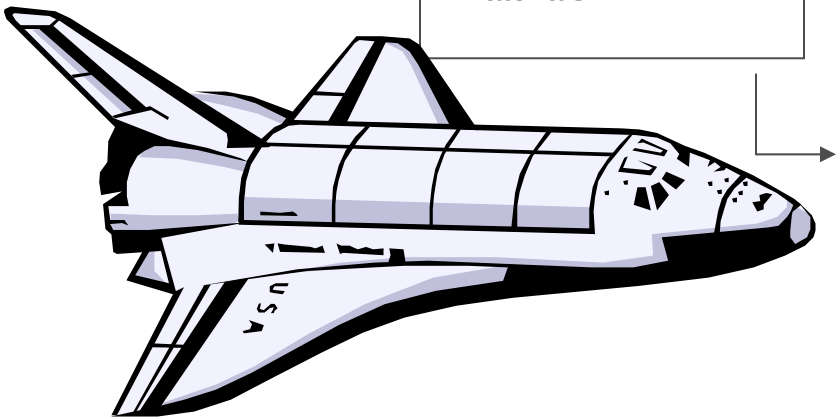
Including:

- Engineers
- Technologists
- Technicians
- Craftsperson's

COMBINE THE CORE TECHNOLOGIES

Including:

- Mechanical
- Structural
- Fluid
- Electrical
- Electronics
- Optical
- Thermal
- Bio
- Materials



TO PRODUCE TECHNOLOGY SYSTEMS

Such as:

- Cars
- Telephone Systems
- Water Filters
- Highways
- Telescopes
- Drill Presses
- Exercise Equipment
- CD Players
- X-Ray Machines
- Computers
- Microwave Ovens
- Lawnmowers
- Furnaces
- Refrigerators

THAT SUPPORT HUMAN ENTERPRISES & INSTITUTIONS

Such as:

- Manufacturing
- Construction
- Transportation
- Communication
- Health & Medicine
- Agriculture
- Energy
- Recreation
- Finance
- Commerce
- Law Enforcement
- Public Safety
- Military
- Education
- Hospitality
- Government
- Personal Services
- Family & Household

CORE TECHNOLOGY

Mechanical

Description

The technology of putting mechanical parts together to produce, control and transmit motion.

Applications

Gear systems in a car transmission, brakes on a bicycle, agitator on a washing machine, latch set on a door.

CORE TECHNOLOGY

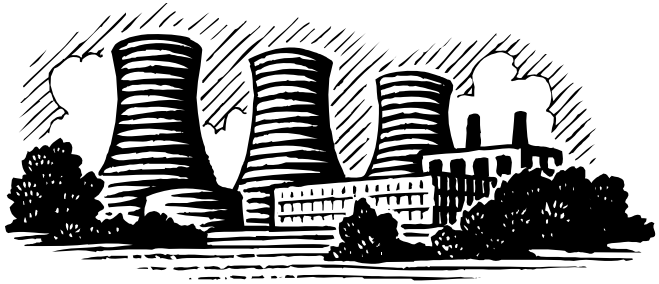
Electrical

Description

The technology of producing, storing, controlling, transmitting and getting work from electrical energy.

Applications

Power plant generator, flashlight battery, light switch, electric motor in a can opener, door bell, electric heater, hair dryer.



CORE TECHNOLOGY

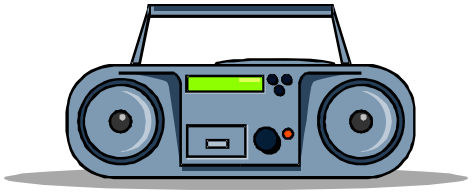
Electronic

Description

The technology of using small amounts of electricity for controlling; detecting; and information collecting, storing, retrieving, processing and communicating.

Applications

Thermostat for controlling temperature, a metal detector, video tape recorder, computer, pocket calculator, telephone, radio and television.



CORE TECHNOLOGY

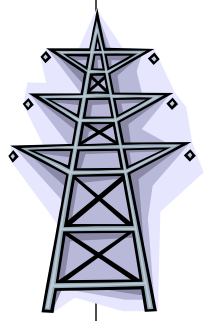
Structural

Description

The technology of putting parts and materials together to create supports, containers, shelters, connectors and functional shapes.

Applications

Legs of a chair, city water tower, swimming pool, buildings, storm sewer, airplane wing, satellite antenna dish.



CORE TECHNOLOGY

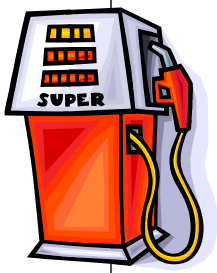
Fluid

Description

The technology of using fluid, either gaseous (pneumatics) or liquid (hydraulic) to apply force or to transport.

Applications

Air brakes on a truck, tires on a car, airfoils on an airplane, warm air heating ducts and fan in a building, hydraulic jack, plumbing in a school, gasoline pump.



CORE TECHNOLOGY

Optical

Description

The technology of producing light; controlling light, using light for information collection, processing, storage, retrieval and communication; and using light to do work.

Applications

Light bulb, LED (Light Emitting Diode), lenses to magnify and reduce, laser speed detector, laser compact disk, fiber optic telephone communication, laser cutting tools, laser surgery instruments.

CORE TECHNOLOGY

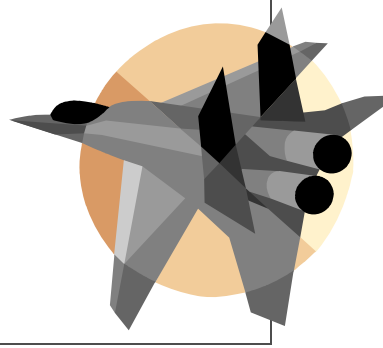
Thermal

Description

The technology of producing, storing, controlling, transmitting, and getting work from heat energy.

Applications

Furnace, hot water heater, toaster, insulation, heat exchanger (radiator, condenser), refrigerator, jet engine.



CORE TECHNOLOGY

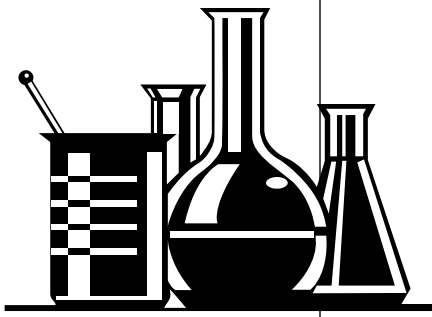
Biotechnology

Description

The technology of using, adapting and altering organisms and biological processes for a desired outcome.

Applications

Stain “eating” enzymes in detergent, bacteria “leaching” of metals from ore, altering plant genes to produce better crops.



CORE TECHNOLOGY

Materials

Description

The technology of producing, altering, and combining materials.

Applications

Producing paper from wood, producing aluminum from ore, drilling holes in wood, annealing to soften metal, casting ceramic, welding metal, laminating wood.

Size of Technology Systems

Small ← → Large

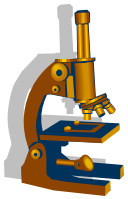
COMPLEXITY OF TECHNOLOGY SYSTEM

Simple ↑ ↓ Complicated

A technology system may be very simple or very complex. It may be very small or very large.

PENCIL

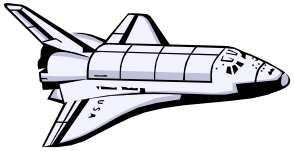
SCISSORS



MICROSCOPE

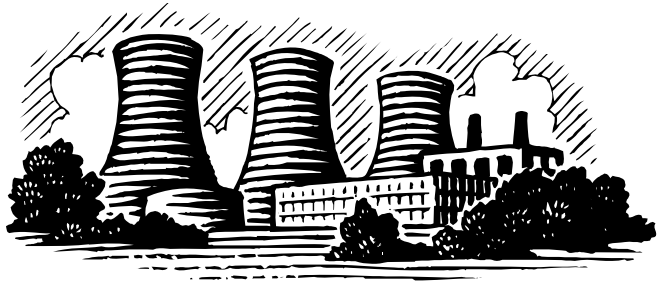
COMPUTER

FIRE ENGINE



SPACE SHUTTLE

NUCLEAR POWER PLANT



Core Technologies Summary

- The Core Technologies are considered to be the "basic building blocks" from which all technology systems are created
- There are nine Core Technologies: (a) mechanical technology, (b) electrical technology, (c) electronic technology, (d) structural technology, (e) fluid technology, (f) optical technology, (g) thermal technology, (h) biotechnology, and (i) materials technology
- Technology systems can be small or large, simple or complex
- The Core Technologies are the bridge between science concepts and real-world technology. They provide numerous opportunities to describe, analyze, and predict physical phenomena using mathematics