**ISTITUTO TECNICO INDUSTRIALE “LEONARDO DA VINCI” - PARMA**

**CLASSE : V A INDIRIZZO: AUTOMAZIONE**

**A.S. 2023/2024 DOCENTE: PAOLA BELLI**

**PROGRAMMA DI LINGUA INGLESE**

**TESTI UTILIZZATI:**

**1 - Kiaran O’Malley – WORKING WITH NEW TECHNOLOGY**

**– PEARSON LONGMAN**

**2 - AA.VV. - COMPLETE INVALSI - HELBLING**

***MODULE 1***

***ELECTRICAL ENERGY AND ELECTRIC CIRCUITS***

* Atoms and electrons
* Conductors and insulators
* How the battery was invented
* Superconductors
* A simple circuit
* Types of circuits
* Current, voltage and resistance

*YouTube related video:*

*Energy 101: Electricity generation (energynownews)*

***MODULE 2***

***GENERATING ELECTRICITY***

* Methods of producing electricity
* Renewable and non- renewable energy sources: advantages and disadvantages

of fossil fuels, nuclear power, and renewables.

* Fossil fuel power stations
* Nuclear power stations
* Controlling a nuclear reactor
* Hydroelectric power plants
* Pumped storage plants, tidal hydroelectric plants
* Wind power plants
* Geothermal energy, biomass and biofuels
* Solar power: solar furnaces and solar cells
* Changing our sources of energy

*YouTube related videos:*

*”Energy 101 Hydorpower” (US Department of Energy)*

*”Energy 101: Solar Power” (energynownews)*

*“Renewable Energy 101: How Does Biomass Energy Work?” (Green Mountain Energy)*

*“Tidal Power 101” (student Energy)*

*“Energy 101: Geothermal Heat Pumps” (US Department of Energy)*

***MODULE 3***

***DISTRIBUTING ELECTRICITY***

* The distribution grid
* The transformer
* Managing the grid
* The smart grid
* Storing Energy

*YouTube related videos:*

*“How do transformers work?” (StraightTalkAlert)*

*“How does the Electric Grid Work?” (Nuclear Energy Institute)*

*“UK introduces world’s first low-carbon T-pylons (Reuters)*

***MODULE 4***

***AUTOMATION***

* Automation and mechanization
* How automation works
* Advantages of automation
* The development of automation
* Automation in the home
* How a robot works
* Automation in the home
* Varieties and uses of robots (humanoids, industrial robots, autonomous mobile robots, appliance robots, remote-control robots )
* Artificial intelligence: Sophia – moral issues

*YouTube related videos:*

*“Voice recognition elevator”*

*“Atlas, the next generation” (BostonDynamics)*

*“Tredemølla | Smarthus II” (REMA 1000)*

***MODULE 5***

***ELECTRONIC COMPONENTS AND SYSTEMS***

* Applications of electronics
* Semiconductors
* P-type and n-type semiconductors
* The properties of semiconductors
* The transistor
* Conventional and integrated circuits
* Microprocessors
* How a microprocessor works

***MODULE 6***

***ELECTROMAGNETISM AND MOTORS***

* Electricity and magnetism
* Applications of electromagnetism
* The electric motor
* Types of electric motors: DC and AC motors; design variations
* Electric cars, hybrid cars, fuel cell cars
* Electric cars: advantages and disadvantages
* Maglev: the transport of the future?

*YouTube related videos:*

*“How does an electric motor work? – DC Motor (The Engineering Mindset)*

*“How to make a Simple Electric Motor” (Howcast)*

*Are Electric Cars Really Green? (PragerU)*

*How Maglev Trains Work (robochitti)*

**INVALSI**: Listening and reading activities ( **CEFR** LEVELS: B1, B2, B2+ )

Parma, 31 maggio 2024

Gli studenti L’insegnante

Paola Belli