تقـــــــــــرير عن

التـــدريب الميـــــــــــداني

الذي تم في الفتـــرة من 5 / 8 / 2022 م وحـــتى 5 / 9 / 2022م

فـــــــــــي

مشروعات جامعة المنوفية (المقاولون العرب)

مقـــدم من الطـالب / اسلام سعيد سعد طه

المقيـــد بالفـرقـــــة الثـانيـــة بقسـم الهندسـة الكهـربية

في العام الدراســـــي 2021 م / 2022م

سبتمبـــــر 2022 م

Index

Thanks and appreciation

Thanks to my parents, who have always supported me in all stages of my life in general and during my training, whether morally or financially. I also thank Prof. Mustafa Al-Shibiny - Professor of Electrical Machines and General Supervisor of Field Training at the College, strives throughout the semester to get us all possible opportunities in the best companies and Prof. Naji Al-Qalashey Head of the Electrical Engineering Department at the College of Electrical Engineering for all the guidance he gave us throughout the training period until writing the report.

I thank all university project engineers for all the information they provided us during training in university projects. I thank the management of Ezz Steel Company - Sadat for providing the great training opportunity that benefited me on the scientific and practical level, and I thank every engineer, manager, and worker I dealt with in the company for their beautiful cooperation and endeavor to provide their knowledge and assistance.

Finally, I would like to thank my friends in the training for their assistance in what I could not fully understand during the training, and their approach, which made the training environment a cooperative and beneficial environment instead of a competitive environment.

figures List

Tables List

Abbreviations List

Abbreviation	Word	Description
SDF	Sub Distribution Frame	Sub-distribution box for floor phones
IDF	Intermediate Distribution Frame	Sub-distribution box for floor phones
MDF	Main Distribution Frame	Main distribution box for college phones
C.B	Circuit Breaker	A circuit breaker cuts off the electricity when the current exceeds the permissible limit
AI	Artificial Intelligence	The science that concerns in making machines simulate the human intelligence

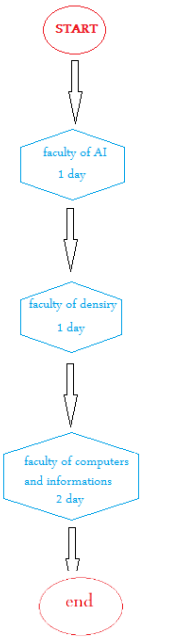
Preface

Knowledge alone is not sufficient to form human thought, it must be accompanied by a practical application in which the person pours his theoretical knowledge to gain in return the skill and the impact of that knowledge on reality by employing the natural and mathematical sciences to benefit humanity in its daily life, it was important for every engineer to take every opportunity for practical participation.Initially, my training was at the Ezz Steel Factory in Sadat City, and the purpose of my choice was that the factory is like an integrated industrial facility. Besides it is a huge factory with a production capacity estimated at one million tons of rebar annually, it is also equipped with automatic packing equipment, Electricity sub-station, three water treatment units, two oxygen production units, and three automatic generators. Then, I chose Menoufia University projects because it was a good opportunity to learn more About the light current and safety systems in the various university facilities.

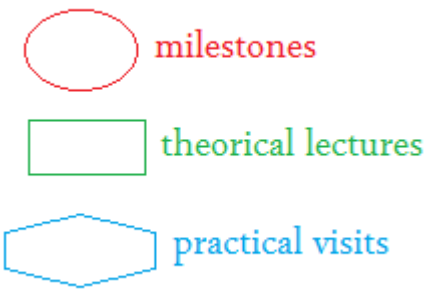
Training Overview

The field training took place during a whole month, during which was divided into :

1. **Lighting and light current systems in the College of Artificial Intelligence**: which included the identification of lighting system, communication lines, and internet lines, a fire detection system
2. **College of Dentistry clinics:** which included identifying the electrical design scheme, distributing lighting and light current in the new clinics that are being built in the College
3. **Electrical connections in faculty computers and information:** by knowing principles of earthing, circuit breakers and some information on light current systems.



University projects



Faculty of Engineering

كلية الهندسة

جامعة المنوفية

Universuty Projects
(Arab Constructors)

جامعة المنوفية

المقاولون العرب
عثمان أحمد عثمان وشركاه
The Arab Contractors
OSMAN AHMED OSMAN & CO

Presenting

Islam Saeed Saad Taha

University projects

Menoufia University was established in 1976 as a regional government university Including four colleges (Agriculture - Engineering - College of Education - Electronic Engineering). Menoufia University has expanded greatly until it includes 13 colleges and one institute, the National Liver Institute

Figure (1-1): the administrative building of Menoufia University

This year, the Arab Contractors Company is implementing the university's projects, an Egyptian governmental company established in 1955 as leading company in the field of construction, engineering consultancy and infrastructure project.

1 Light current systems in college of AI

The Faculty of Artificial Intelligence - Figure (1-2) - is a newly established faculty in 2021 to increase Egypt's opportunities to keep pace with the development in artificial intelligence. It is a practical college depends on the credit hour system

Figure (1-2): Faculty of Artificial Intelligence, Menoufia University

Since the college is interested in studying the applications of object-oriented Programming and information technology, it was obvious that the college should give great care to the electrical, communications and internet systems, because they all represent the backbone of the college, and to provide its laboratories with all the necessary modern electrical equipment.

1-1 Lighting system

The lighting system and electrical connections in the college are like the lighting system in any college on campus, but with some new things, which I noticed the following:

* The lands in the college were artificial - Figure (3-1) they are wooden boards suspended above the ground on pillars to look like concrete floors to connect all electrical wires and internet lines underground, then easily access them when malfunction

* In the laboratories there is a floor box - Figure (4-1) – which are electrical sockets, whether for the installation of electricity sockets or internet wires, they are installed on wooden floors because the laboratory is large and contains large numbers of Computers, and each of them needs two plugs for electricity and a plug for the Internet, and therefore this increases the spread of electric wires *

* cables were either directly visible or under artificial floors or even covered with ducts- Figure (5-1) - and this depends on the characteristics of each cable and the extent of its tolerance, and this is known through the cable code

* For lighting, a photovoltaic cell is used - Figure (6-1) - placed on the surface of the college, when the sunlight disappears, the photocell sends a signal and turns on the lights automatically

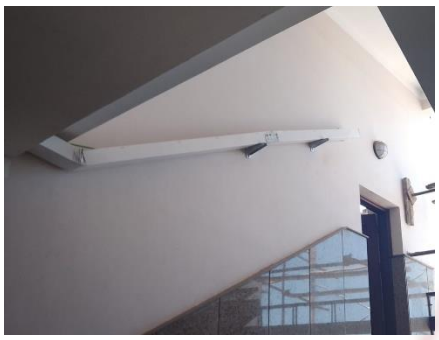


figure (1-5): duct

figure (1-4): floor box

Figure (1-3): Artificial floor

Figure (1-6): Photocell

1-2 Fire Alarm System

The fire alarm system - Figure (7-1) - detects any fire that may occur in the facility, either automatically using sensors or manually using the breaker. It is divided into two types, conventional, which is the most used, and when there is a fire, the alarm spreads in the facility and the other type are addressable, in which the sensor number and the room number in which the fire is located is specified on a digital screen. The most important components of the system are:

- **Sensor:** receives indications of fire occurrence from smoke or high temperature, and often a double sensor is used, which is two smoke and heat sensors together in the same candle to make the detection process more efficient.
- **Fire Alarm Control Panel**: It is the smart brain of the fire alarm and extinguishing system. It is a digital control unit that receives the signal from several detectors, and this signal is converted into a warning alarm by setting off alarm bells, and it consists of four loops. And each loop covers either the

right or left side of each floor in the college, Sensors, detectors, and breakers are connected in parallel to these electric loops, and the board is supplied with a power supply with a 24-volt DC output and a battery in case of power cut

- **Glass breaker:** is operated manually in the event of a fire by breaking the glass and pressing the button inside it, so that the control panel receives the danger signal immediately
- **Alarm bells and sirens:** the alarm output member of the organization that gives an audible signal of danger
- **Fire Extinguishers**: They are either powder, which used to extinguish ordinary fires. There is gas used to extinguish electrical fires that powder extinguishers cannot handle, but they must be handled carefully because the gas is toxic.

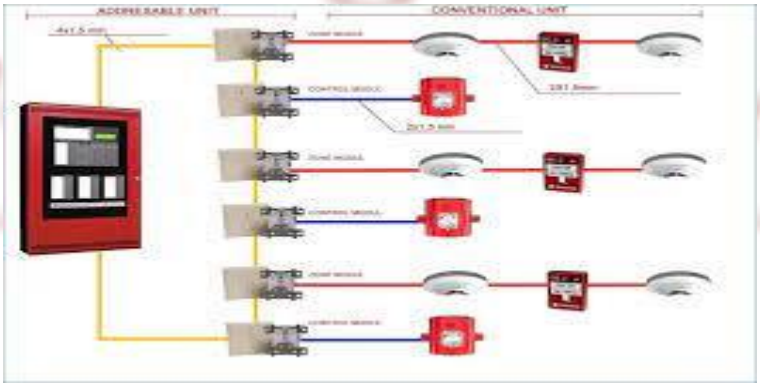


Figure (1-7) diagram of the fire extinguishing system

1-3 communication & Telephones system

First, the telephone device is connected to the socket in each room, then the outputs of all sockets are collected in a sub-collection box SDF or IDF in one cable for each floor, then to the main assembly box MDF, and the cables are connected in a specific connection method, and then the main cable is connected for the college to the central as in Figure (1-8)

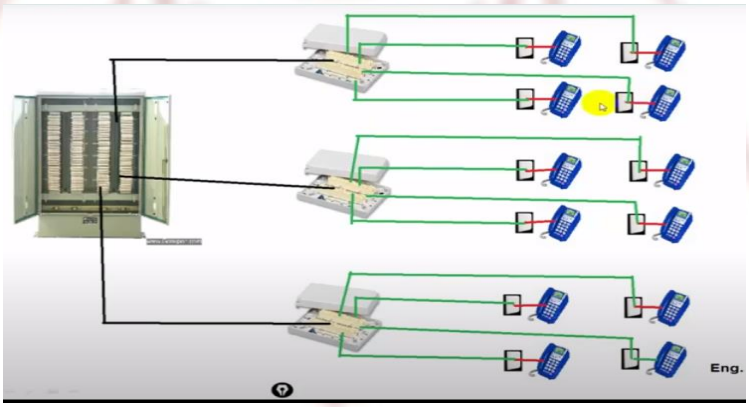


Figure (1-8): Diagram of Telephone and Communication System

1-4 Internet system

The Internet device is connected to the Internet socket in the room, then the socket cables are collected in the Patch Panel to collect and organize the connections, which can connect 24 cables. Then the cables are connected after passing from the connection panel to the switch, which exchanges data between network devices and each other and can accommodate 48 cables Then one public cable comes out of the switch to connect to the main central

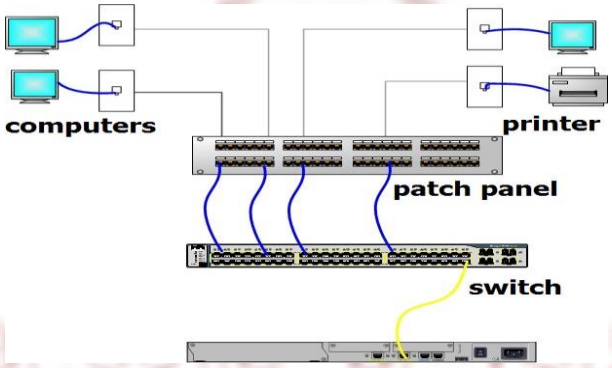


Figure (1-9): A simplified diagram of the Internet system

2 Clinics of faculty of dentistry

The College of Dentistry was established - Figure (1-10) - in 2021 AD to teach everything related to the mouth, face, jaws, teeth and surrounding tissues. It consists of a ground floor and seven upper floors that include amphitheaters, simulation halls, laboratories equipped with the latest equipment, and teaching rooms.

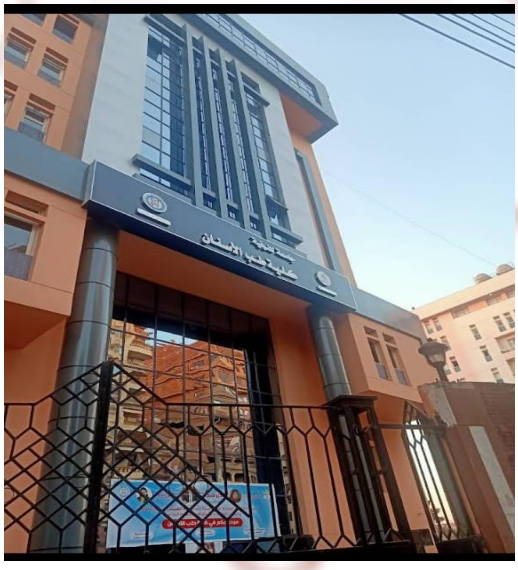


Figure (1-10): the Faculty of Dentistry - Menoufia University

Work is currently underway to complete two upper floor to include dental examination clinics as a means practical training for the student for what he learns inside the college

2-1 lighting distribution

The floor is drawn by determining the number of rooms, their dimensions, and the thickness of the walls. either manually or using AutoCAD, which is the most widely used method.

depending on the architectural form of the building, lighting methods in each room is determined, and this is done in coordination between the architect and the distribution engineer.

The number of torches depends on additional factors such as the type of paint, type of flooring, as well as uses of the room, and all of this can be calculated by deluxe evo.

After determining the number of torches, they are then installed, and the accepted rule is that the distance between each two torches is twice the distance between each torch and the wall.

After that, the total power consumed by each bulb is calculated by:

P_{total}= number to torches*number of bulbs in torch*power of bulb.

After calculating the power, the load current is calculated:

(I_{load} = total power /220) and then calculate the circuit breaker current C.B, which is equal to ($I_{C.B} = 1.25 * I_{Load}$), from which the type of breaker is determined, and the area of the cable. 5 to give the cable cross-sectional area (mm). After that, the result will be as in Figure (1-11) and Table (1-1)

figure (1-11)
lighting distribution in the floor

مفتاح اللوحة	
الرمز	البيان
	كشاف لوفر ٦٠*٦٠ سم
	كشاف بريسماتيك ٦٠*٦٠ سم
	كشاف ١٢٠*٢ سم ضد الايخرة
	كشاف ٦٠*٢ سم لوفر
	كشاف ١٢٠*٦٠سم لوفر
	اسبوت غاطس
	جلوب ٢٥ سم بلمبة ٢٦ وات
	فتوس بكابولى
	مروحة سقف
	شفاط كهربائى ٢٠ سم
	شفاط كهربائى ٣٥ سم معلق او مدرج
	مفتاح انارة ١ سكة
	مفتاح انارة ٢ سكة
	مفتاح انارة ٣ سكة
	مفتاح انارة ديفياتورى ١ سكة
	لوحة توزيع كهرباء
	لوحة مفاتيح مراوح
	لمبة لشعة

table (1-1)
symbols representation

2-2 Electrical outputs

distribution of electrical outputs depends on the use of each room which will determine the number and type of this outputs.

The type of each socket determines its height. For example, the electrical switches are fixed in about 120cm above the ground, but electrical socket are fixed in height between 30 to 40cm and so on.

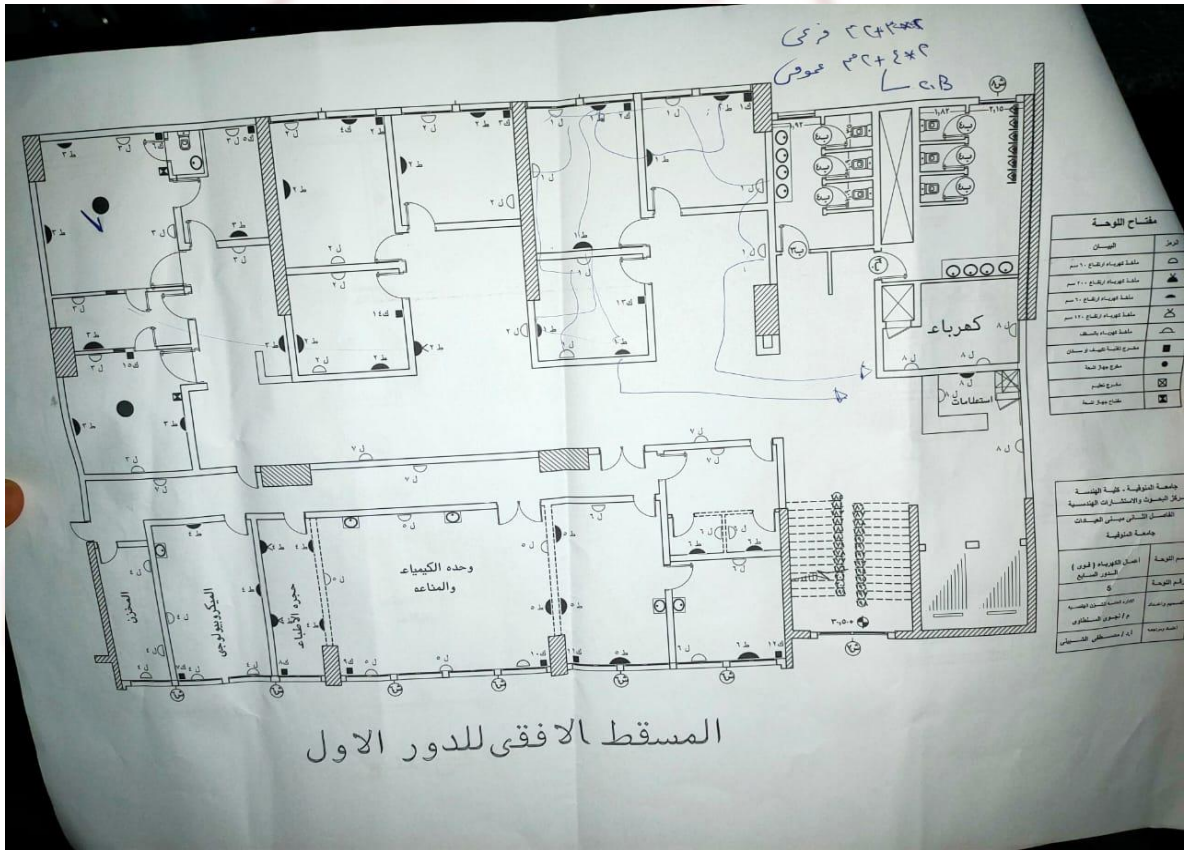


Figure (1-12): electrical outputs distribution in the floor

2-3 light current sysytems

Light current systems have been discussed in the visit of faculty of AI but this time we focused on the distribution of its components including fire sensors, cameras, communication, and internet lines.

Figure (1-13): light current distribution in the floor

3 Electrical connections in the College of Computers and Information

On 4 September 2001, a faculty of Computers and if information was established in Menoufia university. The faculty student having scientific public secondary in the field of mathematic. And graduated programmers and graphic designers and pioneers in the field of computer science of information technology.

3-1 Earthing system

Earthing is the process in which instantaneous discharge of the electrical energy takes place by transferring charges directly to the earth through low resistance wire. Metal can be used in electrical installations without looking for its ability for current transfer

Figure (1-14) earthing system

3-2 Emergency System

The emergency system connects both the transformer connected to the unified network and the diesel generator to an automatic transfer switch, which works in the event of a power outage on the transformer by converting the intake to the diesel generator so that the educational process continues

Figure (1-15):

Automatic transfer switch

figure (1-16):

Transformer & Generator

Engineering standards, safety, and risk management

Some of the projects was already finished like in the faculty of AI so these standards weren't obvious but other projects like in the faculty of dentistry these standards were clear and that includes:

- Participation in work as a team to achieve safety requirements in the work environment.
- Ensure the safety of equipment, machinery, and property of the facility.
- Wearing protective clothing for workers during their work to avoid any dangers.
- Putting barriers around construction areas to protect workers and visitors.
- Placing warning signs and signs at danger areas.

Summary

With this, I have completed my training in three different facilities, by learning the basics of electrical contracting, indoor lighting distribution and light current systems, and principles of electrical protection.

The skills I gained:

1) Observance of occupational safety and security standards and adherence to guiding signs
2) Analyze the electrical systems in area, including lighting, fire systems and communications, and thus determine its usage and safety.
3) The ability to communicate and deal with supervisors and how to ask questions if I wanted to understand a particular topic

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