

# PUA



Mr. Mohamed Ragab  
Pharos University  
Founder

**PHAROS UNIVERSITY ALEXANDRIA**  
**Faculty of Applied Health Science Technology**



Annual Newsletter issued by Medical Equipment Department –Issue (2) -February 2021

**Be Connected**

*Medical Equipment Department*  
*(MED)*



**MED 2020**  
**HIGHLIGHTS**



Issue 2 , February 2021





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**MED 2020  
HIGH LIGHTS**



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### *Department Chair's message*



I am eager to share departmental events regarding the actions of staff members , Welcome to the Medical Equipment Department. Today you have a big share in health care. All medical treatment depends on your contribution to the improvement of medical equipment. Medical Equipment is the application of engineering principles and design concepts to medicine and biology. It combines the engineering design and problem solving skills with medical and biological sciences to improve healthcare diagnosis, monitoring, and therapy.

Medical Equipment is a field of engineering that deals with the development of materials, components, and electronic equipment, needed by medical care centers to provide doctors with efficient tools to diagnose, and treat their patients. *Assoc. Prof. Mohamed I. Badawi*

### *Messages from alumni.....*

***Give man a fish, and he will eat for a day; teach man to fish and he will eat for a lifetime***



#### **Ahmad Hesham**

I graduated from the department in 2019, GPA 3.93, employed since November 2019 as a sales engineer in The Egyptian Office for Importing and Comprehensive Medical Supplies . Gain experience in various medical equipment technologies, particularly in medical devices for radiology .



#### **Abdelrahman Fahmy**

I graduated from the department in 2019, work in the Labtronic for medical equipment that specializes in medical laboratory equipment from September 2019 as a maintenance engineer. Now, have strong experience in semi-automatic style maintenance laboratory equipment, such as semi-automatic chemical analysis and CBC system.



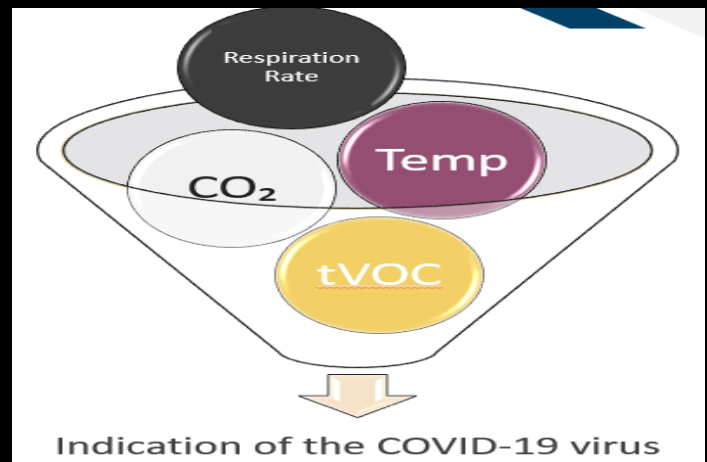
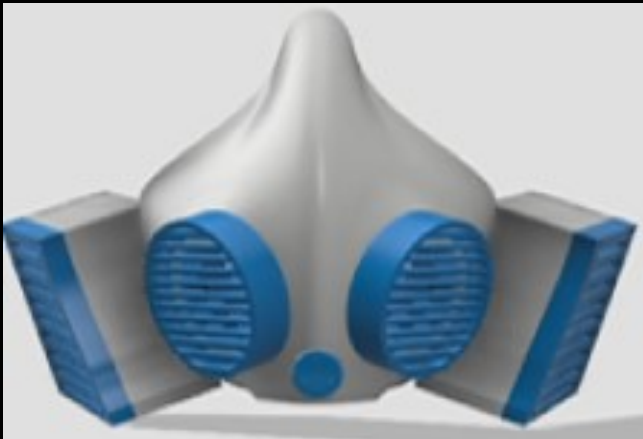
#### **Mohamed Morsy Elsaied**

I graduated from the department in 2019, began working in Alarabia company as a sales engineer for Biomedical Engineering Business (August 2019), which is an exclusive agency (VINNO Ultrasound) in Egypt. I took courses developing my skills as a sales engineering such as Communication skills, Presentation Skills, strategic plan, effective leadership, the art of sales marketing, and siemens Healthcare training in ultrasound. Which

greatly enhanced my skills. After that, I gained many experience and skills in ultrasound field .

## Department Graduation Projects 2020, (Samples)

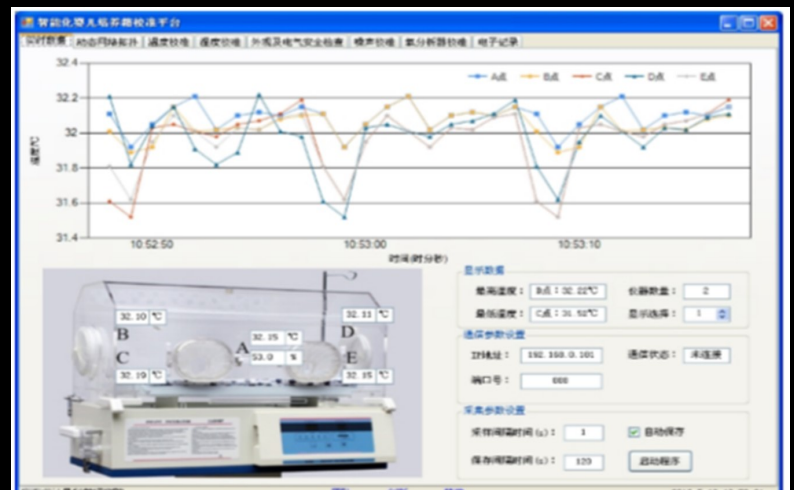
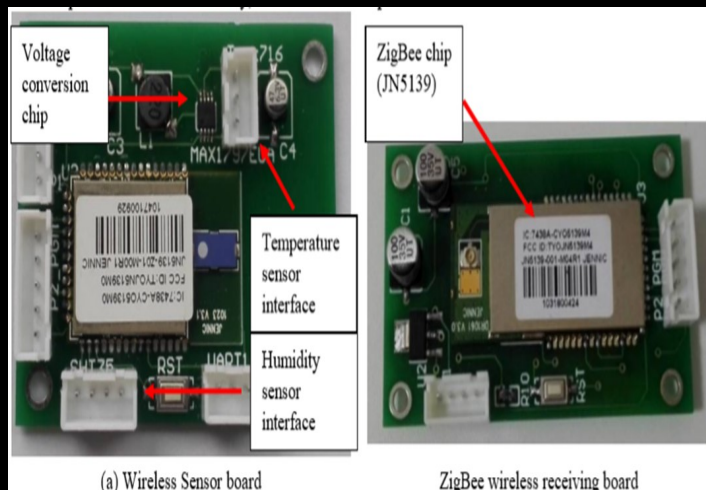
### SCM - Smart Coronavirus Mask



**The SCM is capable of measuring:**

1. Your body temperature in Celsius.
2. Your respiration rate in breath per minute (bpm).
3. The surrounding CO<sub>2</sub> in particles per million (ppm).
4. The surrounding Total Volatile Organic Compounds in particles per billion (ppb).

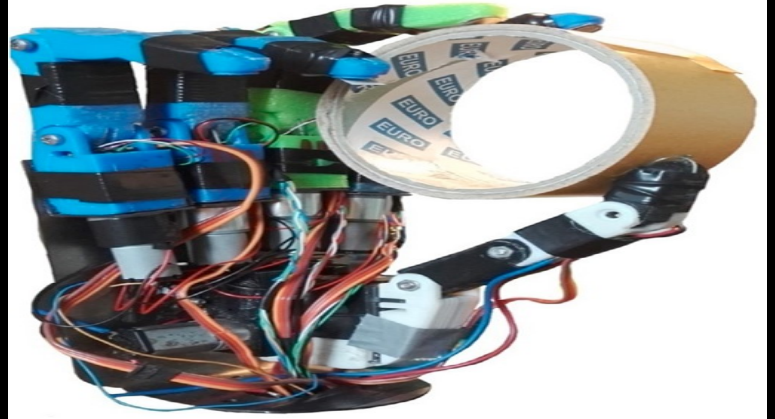
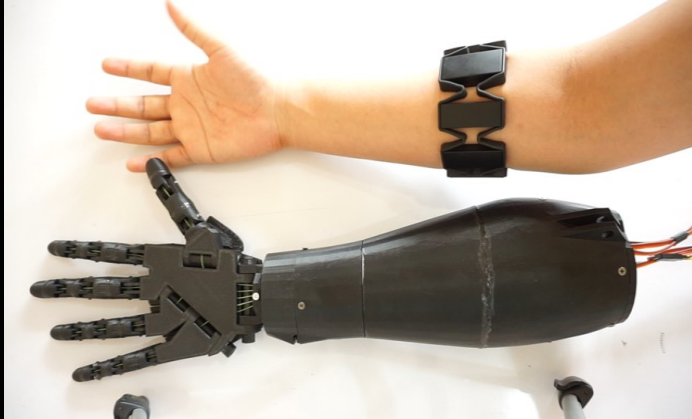
### Infant incubator



**The future infant incubator** is proposed based on the IoT to achieve the remote monitoring and controlling of environment in the infant incubator such as Temperature and humidity. The experimental results Show that this system can provide a real-time and Reliable management of the intelligent infant incubator System. Based on the analysis, a stable and robust security module should be.

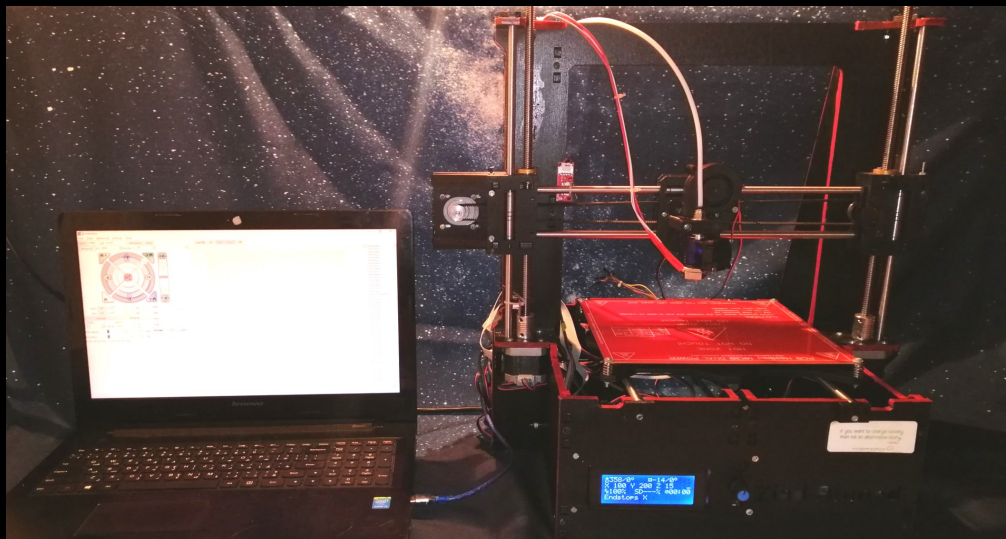
*Department Graduation Projects 2020, (Samples)*

**PROSTHETIC HAND**



The goal of this project was to redesign (theoretical study ) a prosthetic arm to meet the needs of amputees from ages of eighteen to fifty.

**3D Printer & Medical image segmentation**



The students adapted the 3D printer technology and used it in the field of medical imaging. By converting the medical x-ray images into a three-dimensional model using a more advanced printer, through which the doctor can plan before performing the surgery to avoid any potential error and reduce the period of surgery.

**3D printer uses in the medical field:**

- Medical masks
- Mask holder
- Face shields
- Ventilator valve



## Department Contributions in Faculty Scientific Committee



The Scientific Committee at the Faculty of Applied Health Sciences Technology, Pharos University, under the supervision of Prof. Dr. Hassan Ezzat, Dean of the Faculty, conducted a seminar entitled, “A Novel Morphological Analysis of DXA-DICOM Images by Artificial Neural Networks for Estimating Bone Mineral Density in Health and Disease” presented by **Dr. Radwa Abdul Rahman Abdullah, lecturer, in Medical Equipment Department**. The study was carried out with the participation of a research group of faculty members at Pharos University, Prof. Sami Darwish at the College of Engineering and Prof. Mohamed Ismail Badawi, Head of the Medical Equipment Department, Faculty of Applied Health Sciences Technology, and with a research group from the Medical Research Institute, University of Alexandria Prof. Dr. Ehab Ibrahim Abdo, Department of Biomedical Physics and was published in 2019 (Q1 class A) “Journal of Clinical Densitometry: Assessment & Management of Musculoskeletal Health, vol. 22, no. 3, 382-390, 2019”



**Activities** of the Scientific Committee 2020, In the presence of the faculty teaching staff, and college students



Under the patronage of Prof. Ezzat Hassan, the Dean of the College of Applied Health Sciences Technology, Prof. Magdy Bedaiwi, the Vice Dean of the College and Head of the Scientific Committee invited the faculty members and the teaching assistants to attend the second meeting of the scientific committee during the fall semester on Tuesday, 1 December 2020 at room G-616 at 12:30 pm. Major General Doctor Hani Salah gave a lecture entitled “New in uses of ozone as a complementary treatment in medicine”.

## MED 2020 HIGH LIGHTS



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### Pharos University Won the Third Place in “Pandemic TechHack – Egypt 2020”



**HASSAN MOHAMED**



**SCM  
TEAM**



**RAMZY HABEL**



**ENG/KARIM SAIED**



**MARK MILAD**



**DR/EHAB BARAKAT**



**SCM PROJECT**




























#### Partners



#### Strategic Partners



#### Academic Partners



#### Supporting Partners



#### Technology Partners



Students of Medical Equipment Department have won the third place in the “Pandemic TechHack – Egypt 2020” Competition out of 40 participating ideas which was held on Tuesday, 15 April 2020. The competition is a part of “The Egyptian Virtual Hackathon Against Coronavirus” which is a national initiative to unite efforts and resources using technology and science to:

- Confront the epidemic.
- Help reduce the spread of the virus in Egypt.
- Find the technological solutions necessary for dealing with the resulting risks in the case of virus outbreak.

It is worth mentioning that this competition is one of the innovation and entrepreneurship competitions which are managed under the supervision of the Academy of Scientific Research and Technology, the U.S Embassy, the Egyptian Ministry of Health and Population and the American University in Cairo.

The participating students developed a Smart Coronavirus Mask “SCM” using a 3D design program. The SCM is for protection and early detection of COVID-19 and also sending the results to a mobile application that can automatically display and update the health status of the mask user.

The participating students are Mark Miald, Ramzy Habel and Hassan Mohamed Hussien fourth-year students in the Medical Equipment Maintenance Department. This project was made under the supervision of Dr. Ehab Barakat, a Lecturer in the Medical Equipment Department and Mr. Karim Saied, an Assistant Lecturer in the Department.



***Dr. Ayman El-Baz Paid a Visit to Pharos University***



**Pharos University welcomed Dr. Ayman El-Baz, a Lecturer at the University of Louisville, USA on Tuesday, 18 August 2020. He was received by:**

**Mahmoud Mohy El-Din, the President of Pharos University.**

**Norhan Fanaky, Vice-President for Education and Student affairs.**

**Mohamed Gaber, the Dean of the Faculty of Engineering.**

**Fayza El Daly, the Vice Dean of the Faculty of Dentistry.**

**Mohamed Ismail, the Head of Medical Equipment Department in the Faculty of Applied Science Technology.**

**Mohamed Abdel Fattah Ragab, the Secretary General.**

**Mennatallah Gowayed, the PUA International Relations Coordinator.**

**During the visit, possible ways of cooperation were discussed between Pharos University and the University of Louisville in many fields. In addition, Dr. Ayman El-Baz took a tour in the faculties of Engineering, Dentistry and Applied Science Technology and praised the university's facilities. At the end of the visit, Prof. Mahmoud Mohy El-Din presented the university shield to Dr. Ayman El-Baz.**

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## Department Staff Member Participation in International Scientific Organization



**Dr. Ehab Barakat** lecturer , in Medical Equipment Department Member of the Jury of African Forum for Innovation and Technology held in Luxor 24 : 27 Jan 2020 . For Youth innovators all categories except university less than 14 years.



**Ahmed Hisham Tawfiq**, in clinical training year, graduated from the Department of Medical Equipment year 2019 demonstrate a lecture entitled ((Internet of Medical Things does it worth?)) In the third Alexandria Festival for Creators on Saturday, February 8, 2020 under the supervision of Dr. Mervat Mustafa, a lecturer in Medical Equipment Department, under the auspices of the Red Crescent Society and the Governor of Alexandria



**A.L Kariim Hafez** , member of the jury of the competitions of the Bibliotheca Alexandrina of Science and Engineering Exhibition (BASEF) on 3,4 Feb 2020 at the Bibliotheca Alexandrina  
**Objective:** Representing Egypt at the Intel International Exhibition for Science and Engineering (ISEF)



*The Medical Equipment Department Participated in  
“Egypt Make Electronics” Innovation*



Under the auspices of Prof. Ezzat Hassan, the Dean of the Faculty of Applied Health Sciences Technology and Prof. Mohamed Ismail Badawi, the Head of the Medical Equipment Department, the department participated in “**Egypt Make Electronics**” Innovation funded by ITEDA and the Ministry of Communications and Information Technology. This was held on Saturday, 21 November 2020. It is worth mentioning that this participation was managed under the supervision of **Dr. Ehab Barakat, a Lecturer in the Medical Equipment Department** and a trainer of technological innovation and entrepreneurship. A number of third and fourth year students, faculty members and teaching assistants visited EME Innovation Hub- Borg to be acquainted with the available facilities and gave the students ideas for their graduation projects. Moreover, they attended the closing ceremony of the “Egypt IoT and AI challenge 2020” competition.

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HIGH LIGHTS**



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### *The Medical Equipment department Student Interns Made an Electronic Sterilization Gate*



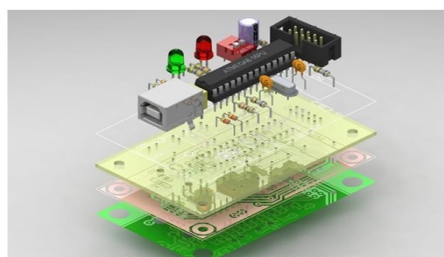
Under the auspices of Prof. Ezzat Hassan, the Dean of the Faculty of Applied Health Sciences Technology and Prof. Mohamed Ismail Badawi, the Head of the **Medical Equipment Department**, the student interns of the academic year 2019/2020 made an **electronic sterilization gate** during their clinical training at **Medical Research Institute**, Alexandria University. This was managed under the supervision of Prof. Amal Ghanem, the Dean of Medical Research Institute and Dr. Ibrahim Goma, the Head of Medical Equipment Department in Medical Research Institute. Within the framework of the positive contribution of PUA in the precautionary measures taken by countries preventing the spread of COVID-19, The electronic sterilization gate has been made by the students equipped with a sensor to alert a person's entry and then it starts sterilization for 5-10 seconds and it is also equipped with four machine guns to sterilize the body with safe material.



*The Medical Equipment department  
Organizes an Online Summer Workshop Entitled “Basic Electronics Design and  
PCB”*



## Basic Electronics & PCB Design

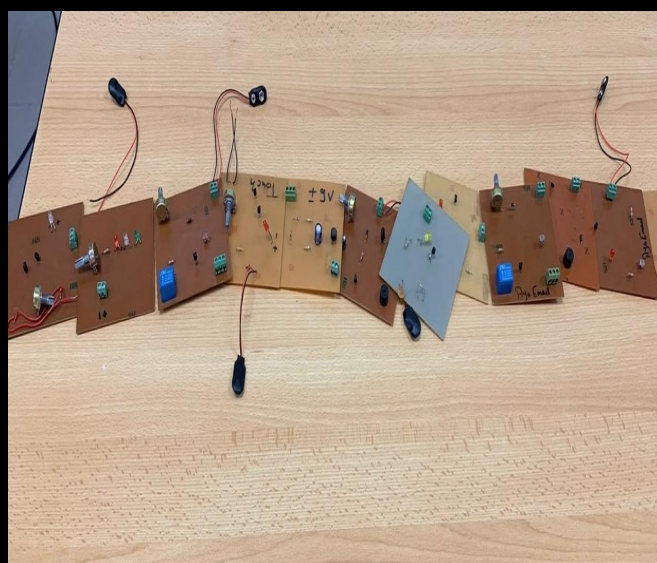


### Workshop Targets

- Learn the basic components of electronics.
- Deal with the basic operation of electronic devices and some common applications.
- Design a custom printed circuit board (PCB) from a breadboard prototype.
- Implement circuits on PCB boards using different Soldering techniques.



The Faculty of Applied Health Sciences Technology Organizes an **Online Summer Workshop** Entitled “Basic Electronics Design and PCB” for all the students of the Medical Equipment Department. The workshop is delivered by **Eng. Karim Saied, an Assistant Lecturer in the Medical Equipment Department**. It is worth mentioning that this workshop is held under the auspices of Prof. Ezzat Hassan, the Faculty Dean and Prof. Mohamed Ismail Badawi, the Head of the Medical Equipment Department.




**Certificates of the summer workshop "Electronic Circuit Design and PCB"** were delivered to the tutor and . Prof. Dr. Ezzat Hassan, Dean of the Faculty of Applied Health Sciences Technology, praised the submitted projects and the level of students.

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*A workshop for students of the Medical Devices Department  
on the Zoom platform*



## Arduino Programming and Hardware Fundamentals with Hackster





**Workshop  
Targets**

- Arduino programming tutorial with ++ C / C
- Construction of functional circuits
- Control sensors, robots, and IoT devices
- Write a program to perform mathematical calculations
- Circuit design and coding



Under the patronage of Prof. Dr. Ezzat Hassan, Dean of the College of Applied Health Sciences Technology and under the supervision of Assistant Professor Dr. Mohamed Ismail Badawi, Head of the Medical Equipment Department, a workshop will be held during the mid-year vacation during the period from January 31, 2021 to February 7, 2021 via the Internet "Programming training and its use in Practically designing and controlling the electrical and electronic circuits. **The trainer, Engineer / Abdul Rahman Gamal, Assistant Lecturer, Department of Medical Equipment.**

### *Medical Equipment Department Students Participation*



Within the framework of Pharos University's cooperation with the Francophone University Agency, AUF, **student / Dina Mostafa Gad, from the third level, Faculty of Applied Health Sciences Technology, Department of Medical Equipment Technology**, attended a workshop on 16 and 17 November 2020 on the Blackboard platform on mediation and dispute resolution in which Dr. Leila Rizk lectured From Saint Joseph University Beirut with the title "Conflicts between the academic body and students".

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## Medical Equipment Department Students Seminars Samples



**Seminar Series Medical Equipment Department**  
Fall 2020 – Date : 11/11/2020 – G616 – 12:05 Pm

**3<sup>rd</sup> Level  
5<sup>th</sup> Semester**



201800021 **Mohamed Essam Shaban Ahmed**  
201800023 **Marwan Kholeif Abdelhamied**  
201800028 **Youssef Abdelhamed El-nwsany**  
201800029 **Youssef Mohsen Elsyed**



### Electrocardiograph machine



**Electrocardiography** is the process of producing an electrocardiogram (ECG or EKG). It is a graph of voltage versus time of the electrical activity of the heart using electrodes placed on the skin. These electrodes detect the small electrical changes that are a consequence of cardiac muscle depolarization .....



**Seminar Series Medical Equipment Department**  
Fall 2020 – Date : 4/11/2020 – G616 – 12:05 Pm

**3<sup>rd</sup> Level  
5<sup>th</sup> Semester**



201800098 **Dina Mostafa Said Gad**  
201800026 **Merna Rafaat Abdelhady**



### Artificial heart machine



**Artificial heart** is a device that replaces the heart. Artificial hearts are typically used to bridge the time to heart transplantation, or to permanently replace the heart in the case that a heart transplant is impossible.....



**Seminar Series Medical Equipment Department**  
Fall 2020 – Date : 18/11/2020 – G616 – 12:05 Pm

**3<sup>rd</sup> Level  
5<sup>th</sup> Semester**



201800009 **Bishoy Mikheal Rostom Abdo**  
201800014 **Sad Alsaid Ramadan**  
201800057 **Mohamed Hadeday Ali**



### Infant Incubator



**Infant Incubator** is a rigid box-like enclosure in which an infant can be kept in a controlled environment for observation and care. The device include a heater, a fan, a container for water to add humidity, a control valve through which oxygen may be added, and access ports for nursing care.....