

HEALTHCARE ENGINEERING AND MANAGEMENT (HEM)

Based on Credit Hours System (CHS)



Biomedical Engineering?!!!

What does a Biomedical Engineer do??

What is Biomedical Engineering??

Is that a recognized course?

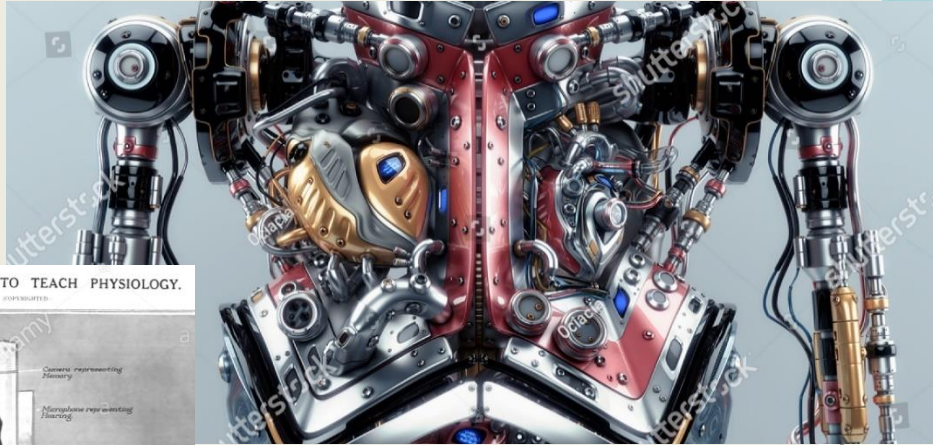
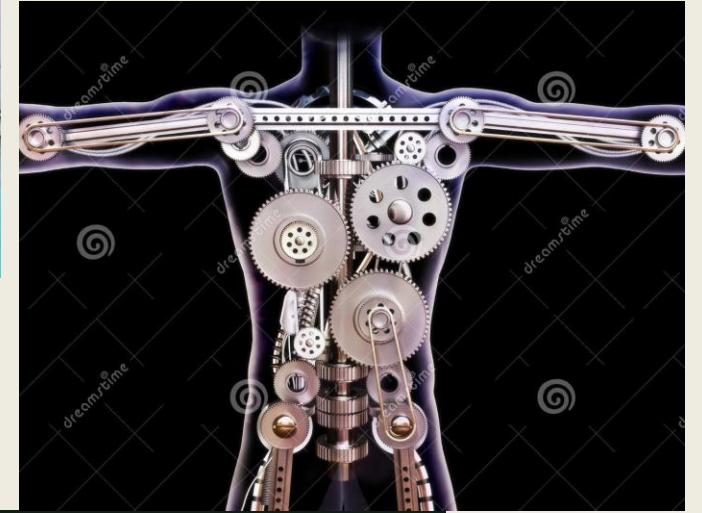
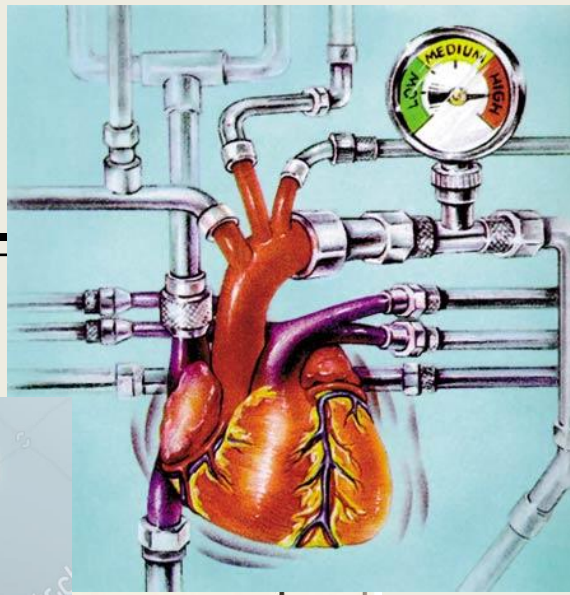
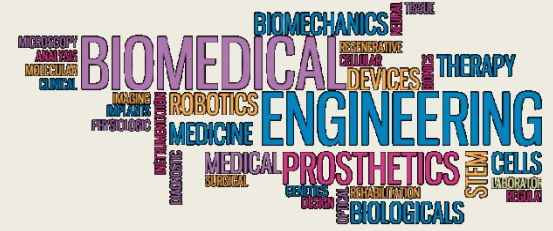
Biomedical = Biotechnology ???

Is that a part of Engineering??

Biomedical Engineer

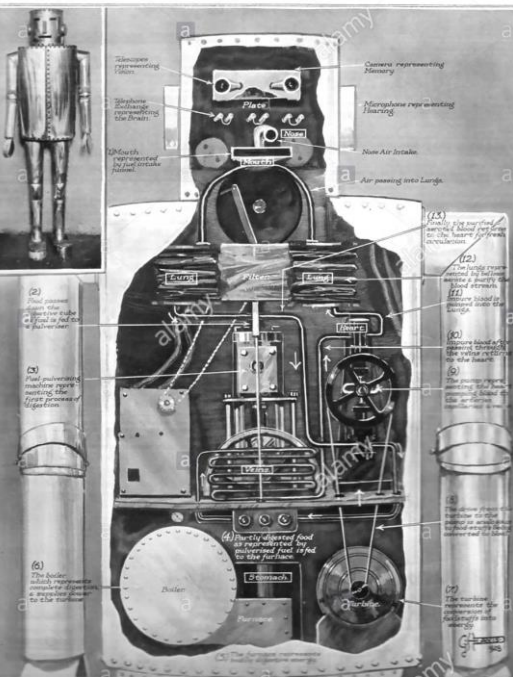
Biomedical Engineering

- Human body as an Engine



THE MECHANICS OF MAN: A ROBOT TO TEACH PHYSIOLOGY.

DRAWN BY HENRÉ SPITZ, M.D., G. H. DAVIS. COPYRIGHTED.

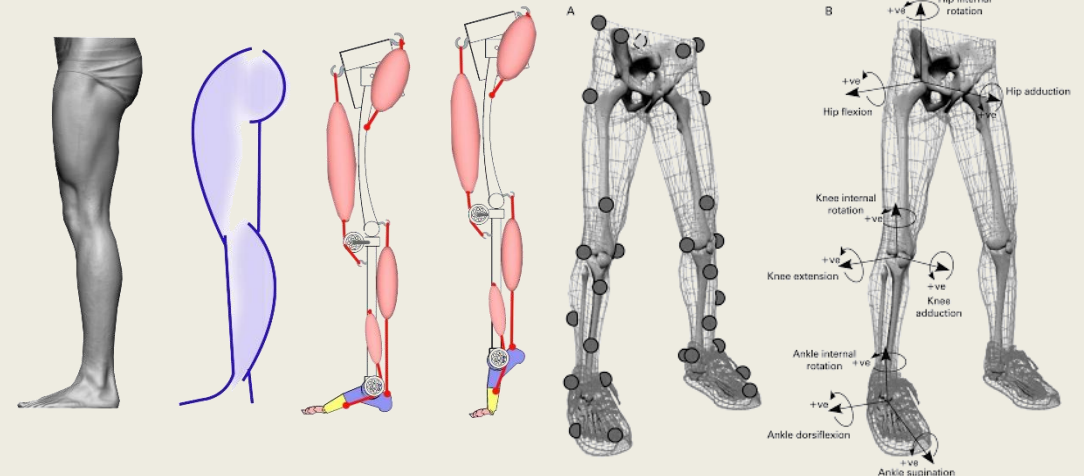
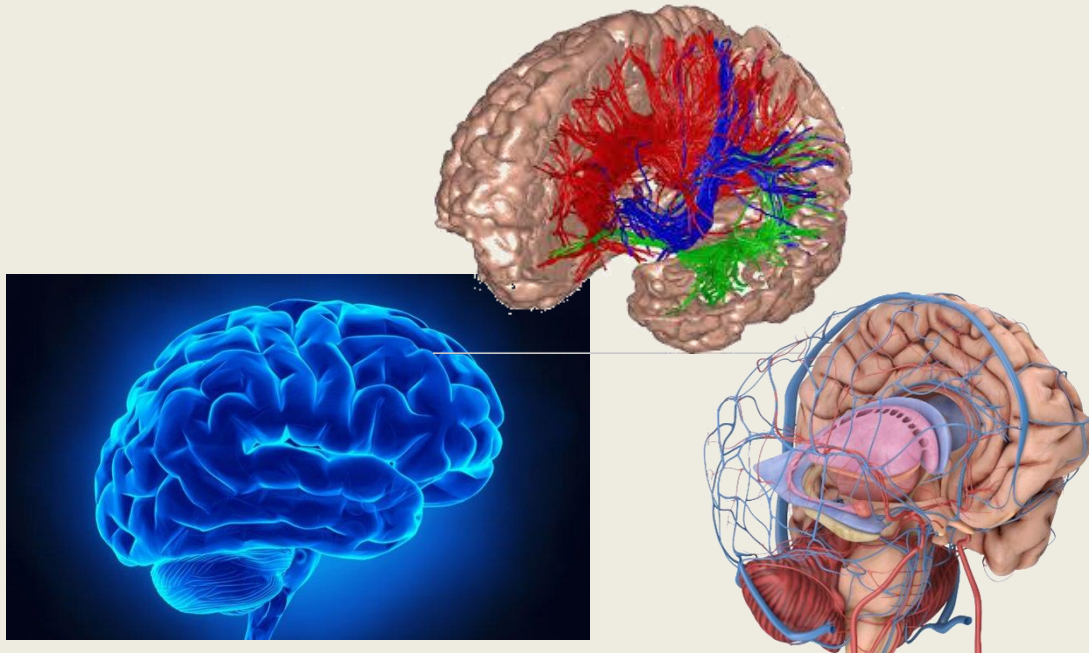
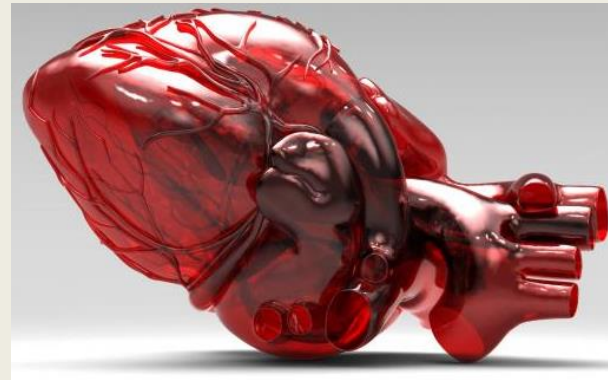


Aus: KAHN, DAS LEBEN DES MENSCHEN / Franke'sche Verlagsbuchhandlung, Stuttgart 1907

Biomedical Engineering Aims

- It's all about human body as an engine for the aim of:

Understanding



Biomedical Engineering Aims

- It's all about human body as an engine for the aim of:

Diagnosis



Biomedical Engineering Aims

- It's all about human body as an engine for the aim of:

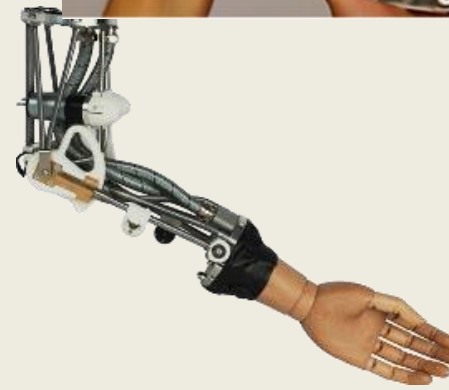
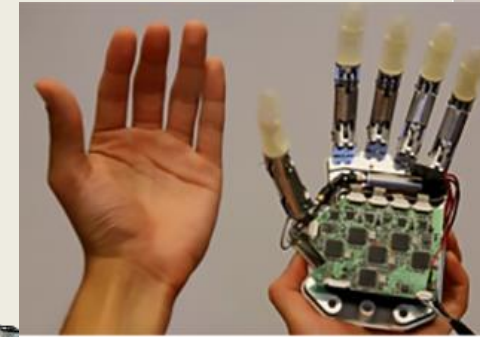
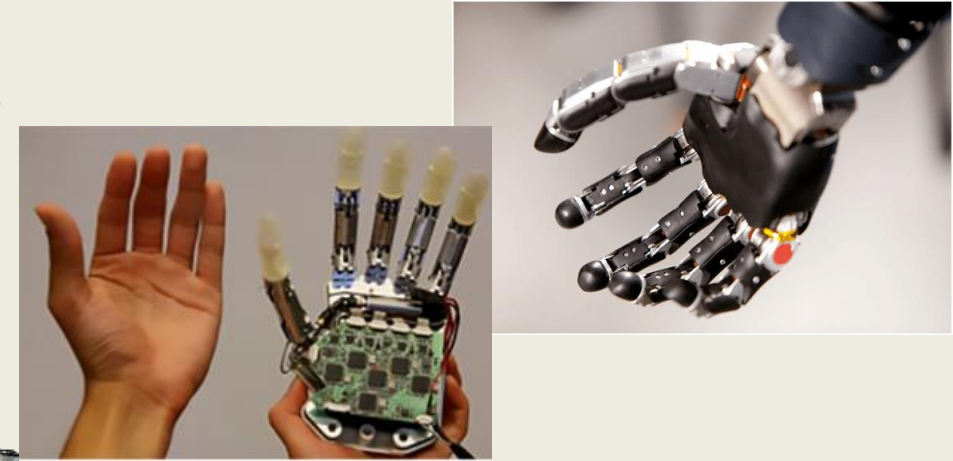
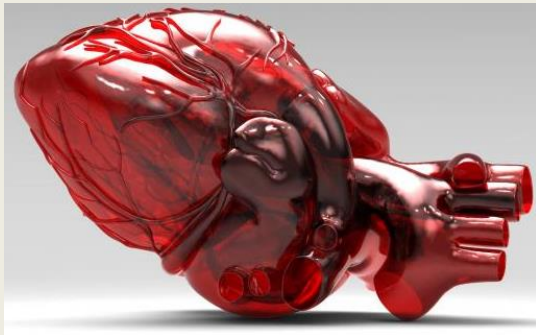
Helping with solutions



Biomedical Engineering Aims

- It's all about human body as an engine for the aim of:

Providing replacements (imitate...imitate)



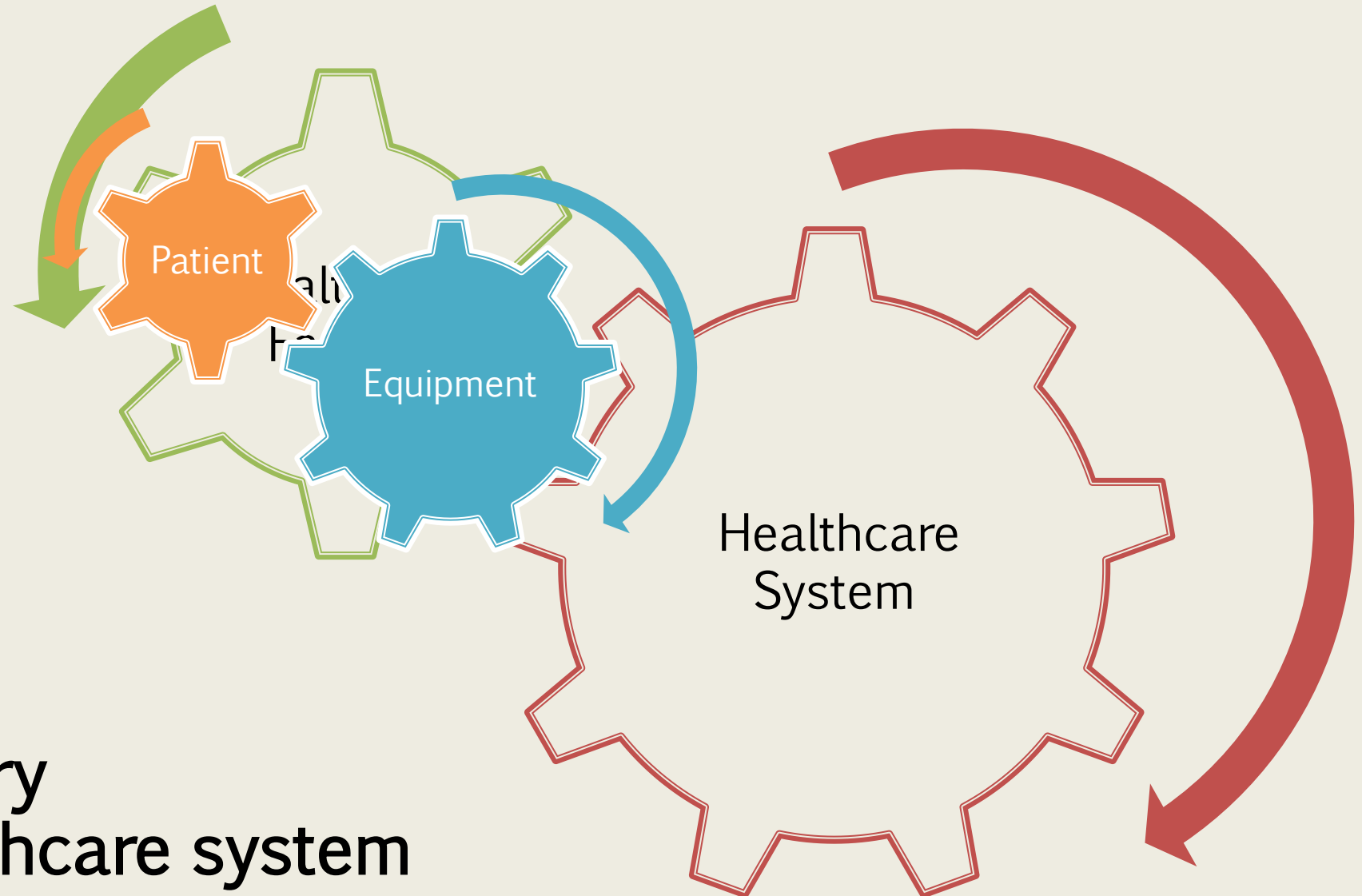
Biomedical Engineering

- It's all about human body as an engine for the aim of:

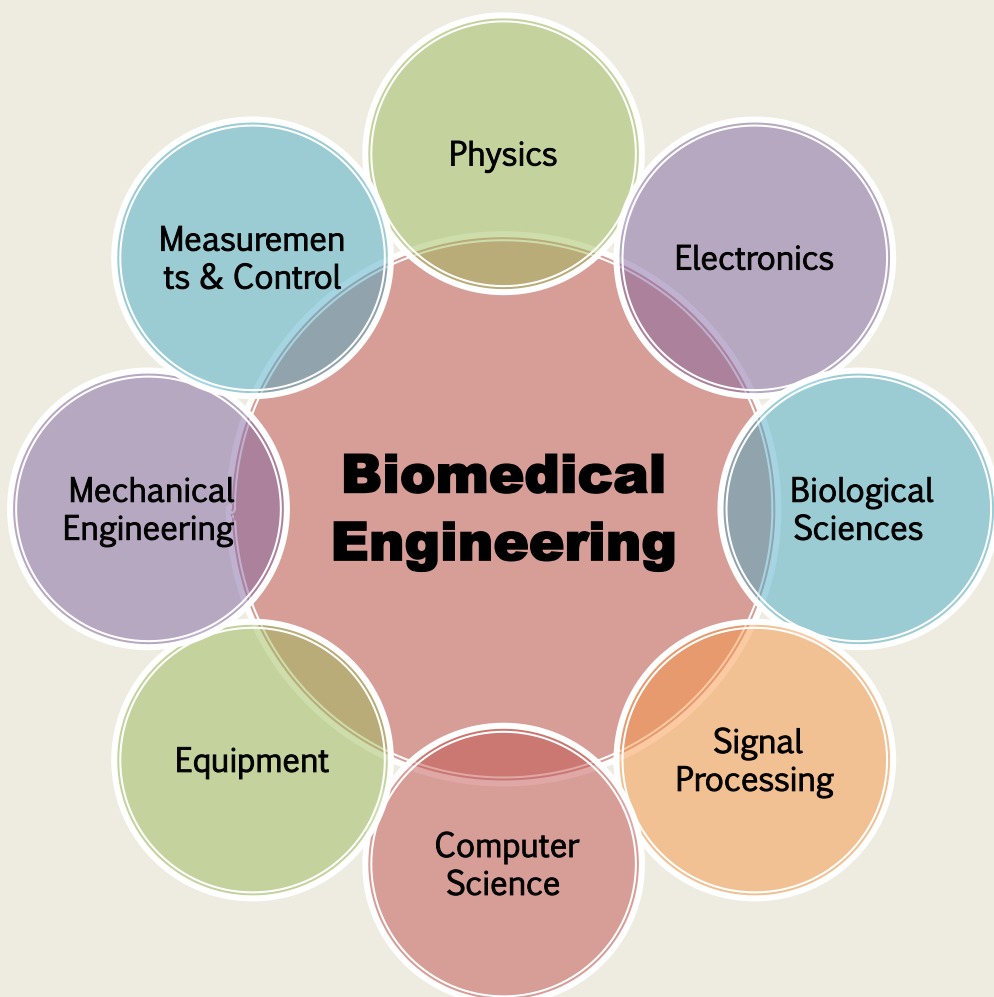
Proper workshop



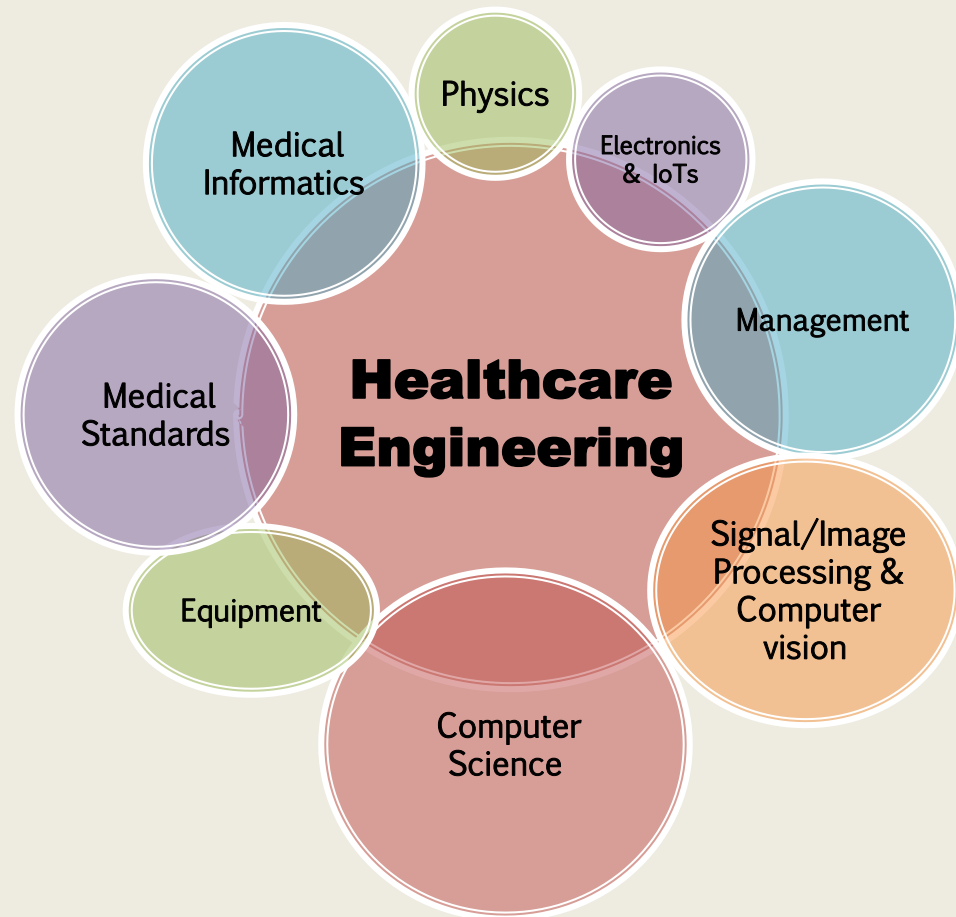
Biomedical Eng. & Healthcare Eng.



Focus on machinery
Focus on the healthcare system



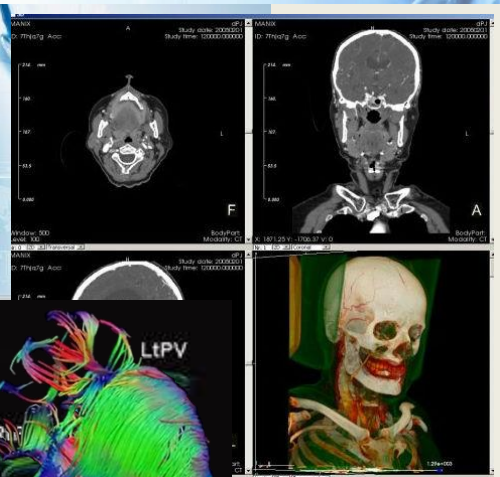
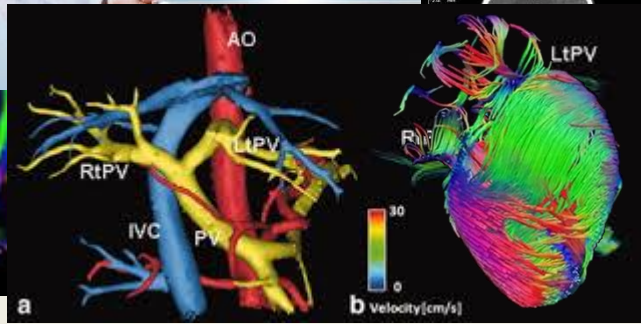
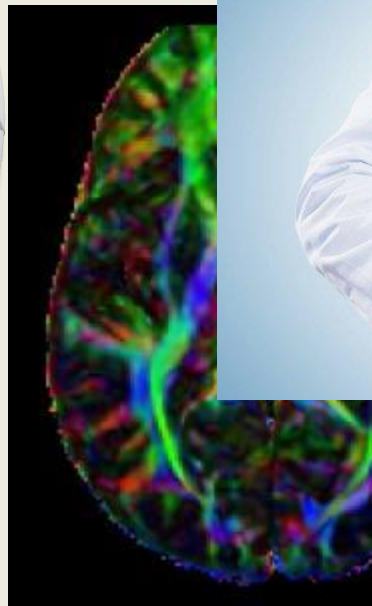
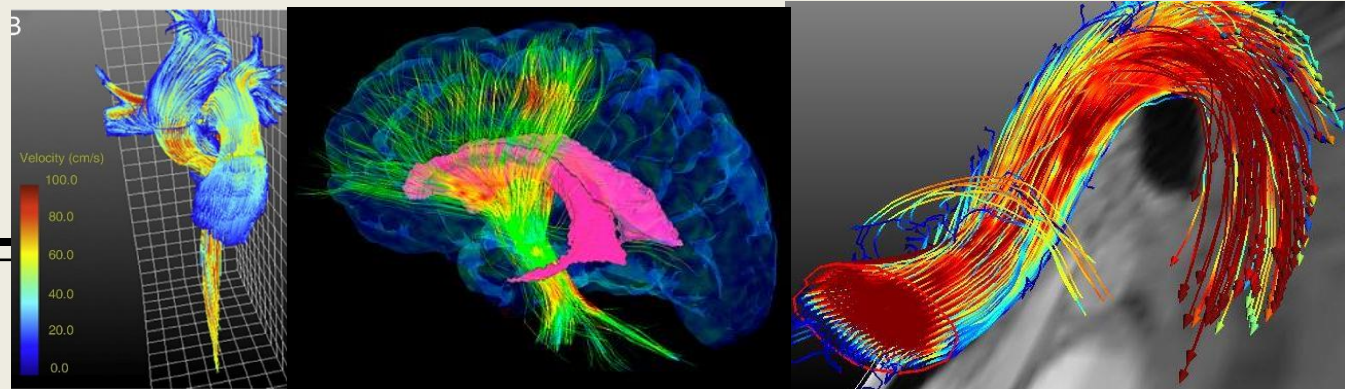
Medical Equipment



Healthcare Facilities & Healthcare System

HEM graduates

Jobs



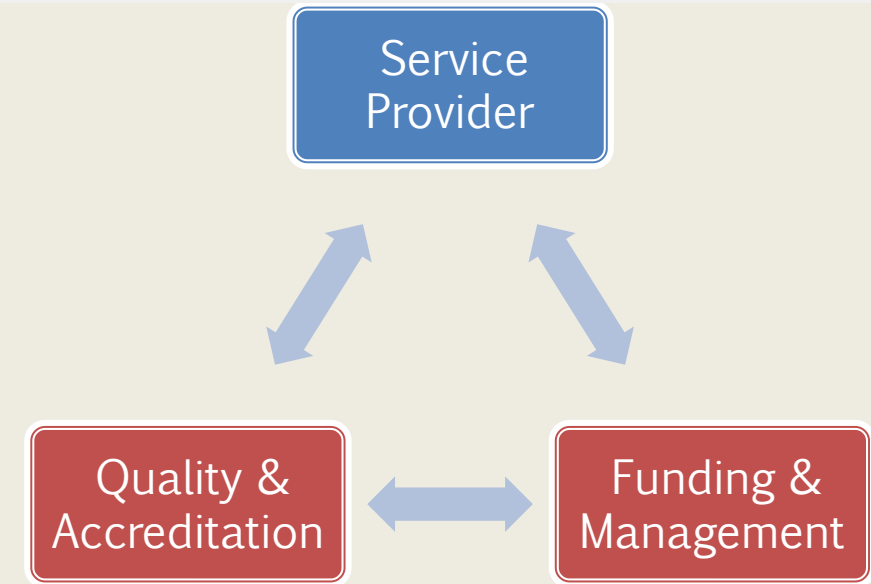
National Market

- National development
- Healthcare system reform plan
 - Clinical engineering,
 - Healthcare facilities designing & planning,
 - Medical standards,
 - Medical software,
 - Healthcare management,
 - Healthcare information systems.

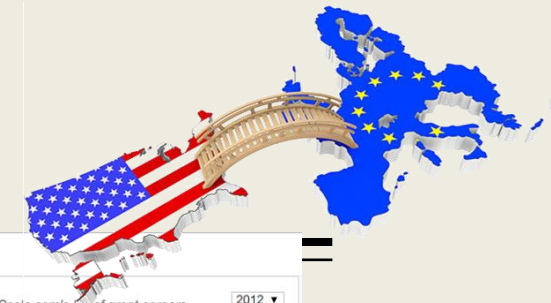


الدكتور أحمد عماد الدين وزير الصحة

6- ثلاث هيئات معنية بتطبيق القانون، وهي هيئة الرعاية الصحية، وتكون معنية بمنافذ تقديم الخدمة، وهيئة الجودة والاعتماد، وتمنح المستشفيات الاعتماد وفق معايير الجودة المعمول بها، وهيئة التأمين الصحي، وتتولى إدارة وتمويل التأمين الصحي.



Regional & International Market



14 مليار دولار حجم مشاريع الرعاية الصحية بالسعودية

السبت 21 جمادى الأولى 1435 هـ - 22 مارس 2014م



Gulf countries offering international investment opportunities in health care

N.P. Krishna Kumar

Dubai

A shortage of hospitals, clinics and related infrastructure, along with an increasing population and official push to promote medical tourism, makes the health care sector in the Gulf region a promising area for investment. The increasing emphasis on health care as part of economic plans is exemplified in the UAE Vision 2021 and Saudi Vision 2030. Both countries are promoting public-private partnerships to finance health-care projects. "Dubai needs 1,000 hospital beds in the next five years just to keep pace with the growing population growth, which translates to seven hospitals, at around 150 beds per hospital," said Craig Plumb, head of research at Jones Lang LaSalle MENA.



Promising sector. Official opening of King College Hospital London's new Medical Centre in Jumeirah. (Dubai King's College Hospital UAE)



TVM Capital plans \$200 mln investment in UAE healthcare portfolio

CNN Money

BEST JOBS IN AMERICA CNNMoney/PayScale.com's list of great careers

1. Biomedical Engineer

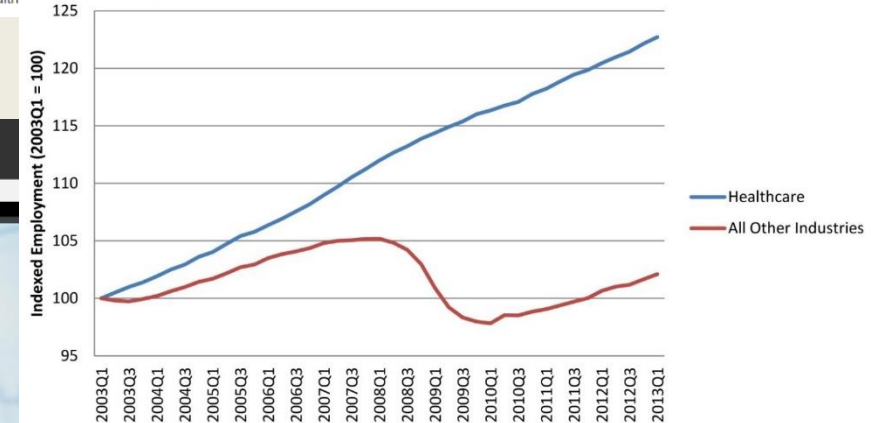
Like 6.8K Tweet Share G+ Email Print

Median pay: \$79,500
Top pay: \$124,000
10-year job growth: 61.7%
Total jobs*: 15,700

What they do all day? Science fiction is a little less fictional in the day-to-day work of biomedical engineers, who design prosthetic limbs and artificial organs or regenerate tissue. They also create drug formulations, develop pharmaceuticals or collect and analyze biological data, among other work. In this field lies the intersection of biology and engineering skills, which helps health

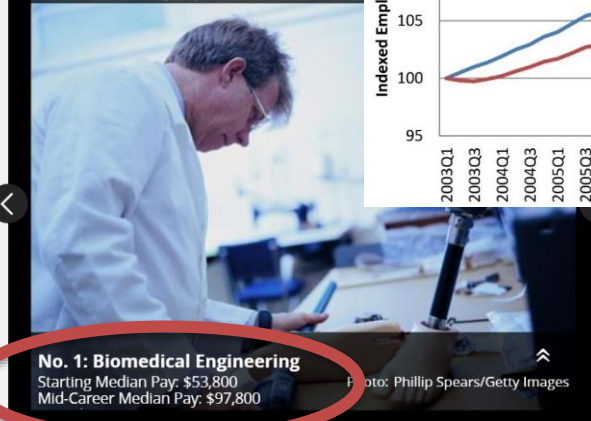


U.S. Employment Growth in Healthcare and All Other Industries, 2003Q1-2013Q1



Forbes

15 Most Valuable College Majors

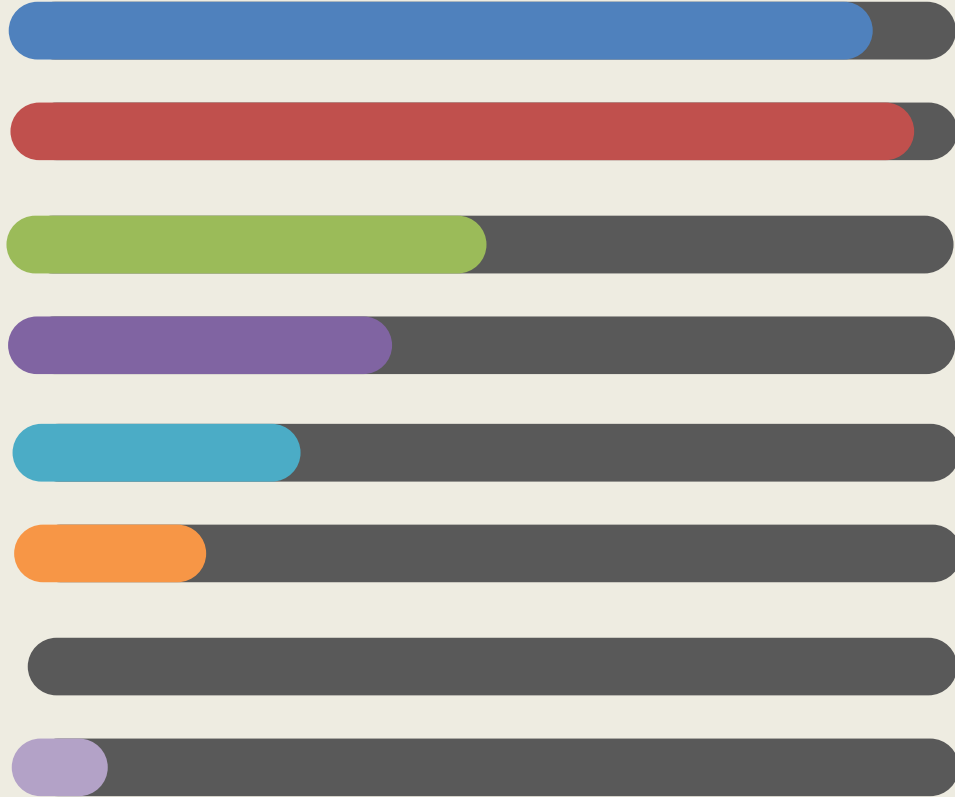


No. 1: Biomedical Engineering

Starting Median Pay: \$53,800
Mid-Career Median Pay: \$97,800

Photo: Phillip Spears/Getty Images

BME



Circuits & Electronics

Signals, Measurements
& Control

Biological Science

Mechanical Engineering

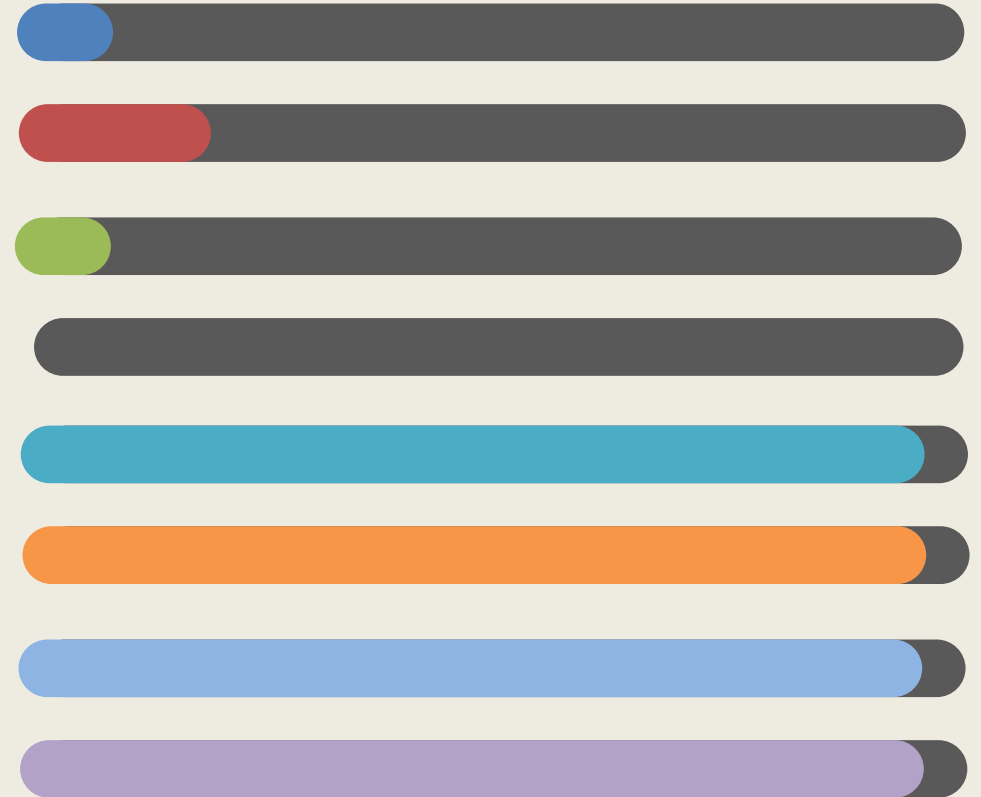
Medical Software

Medical Informatics

Medical Standards

Management

HEM



CCE-C



HEM

Circuits & Electronics

Physics

Computer Architecture

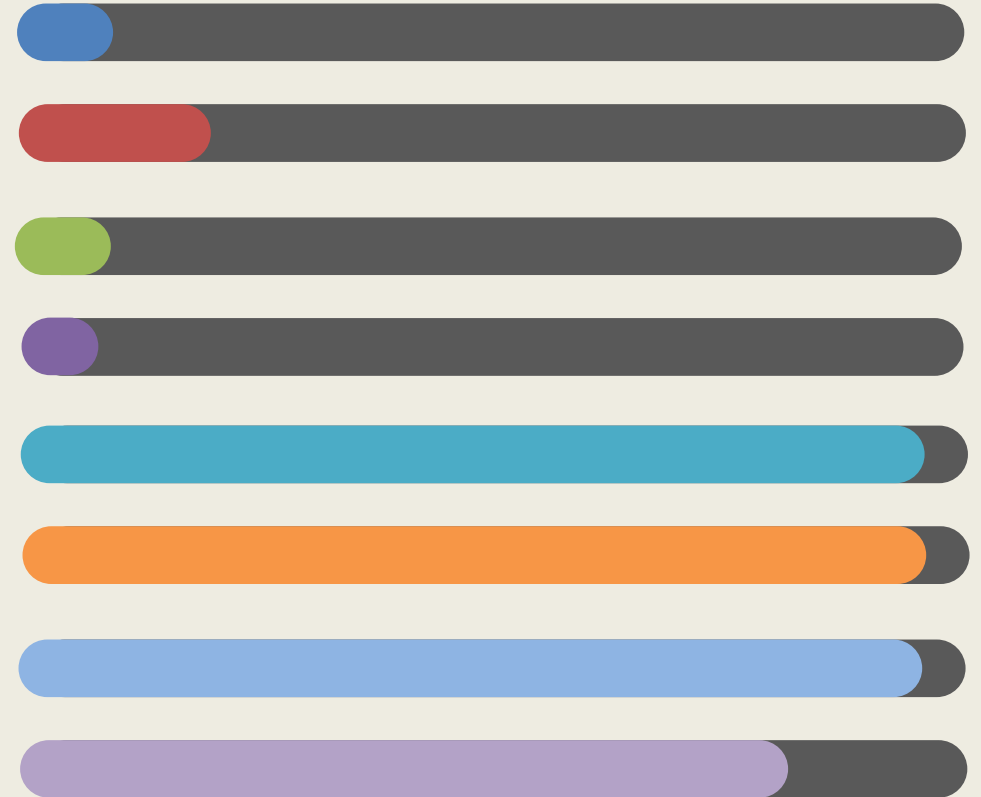
Operating Systems

Software Development

Medical Software

Medical Informatics &
Standards

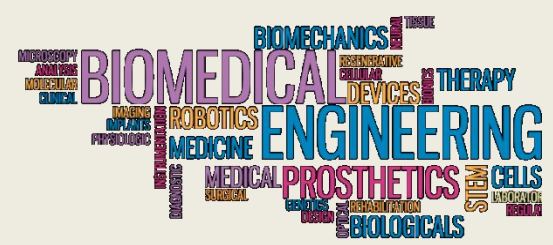
Management





BIOMEDICAL ENGINEERING AREAS

Machineries



- Bioinstrumentation
- Medical imaging
- Surgical instruments
- Medical devices
- Medical robotics



Measurement Devices

- Monitoring



- Basic tools



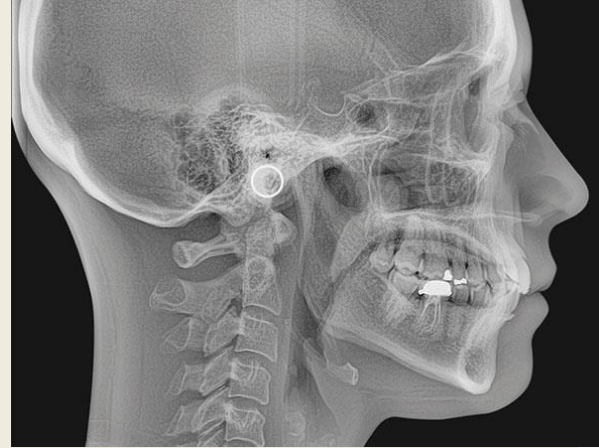
- Labs



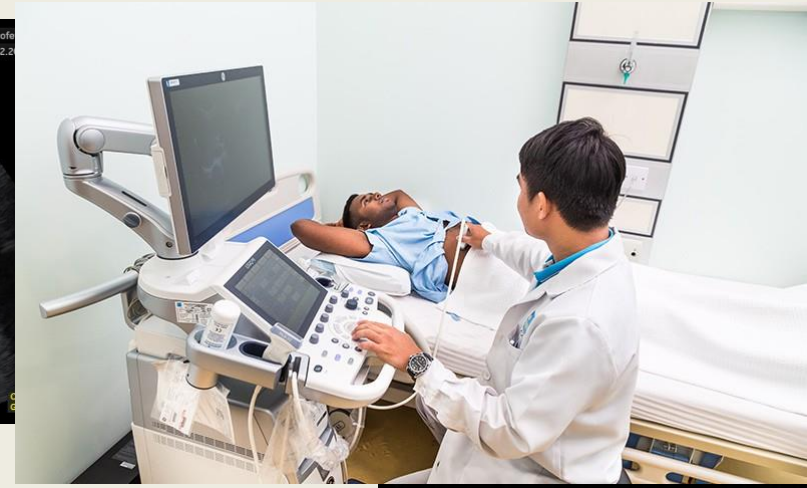
Dhirendra Kumar
Mb.: 9717912003
Email: asialabtech@gmail.com
Asia LabTech
Supplier of Scientific Instruments, Lab Instruments, Analytical Instruments, Balances, & Life Science Products

Radiological Devices

- X-Ray



- Ultrasound

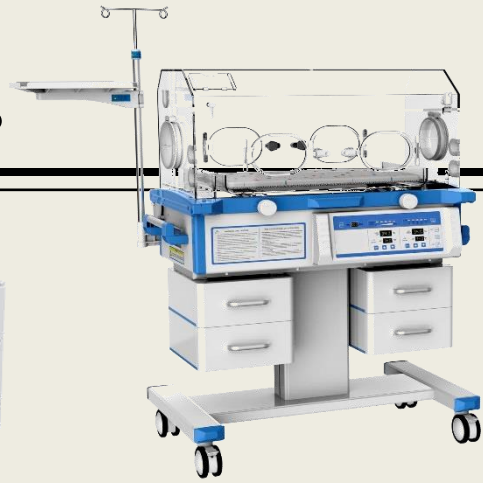


- Magnetic Resonance Imaging



Assisting Devices

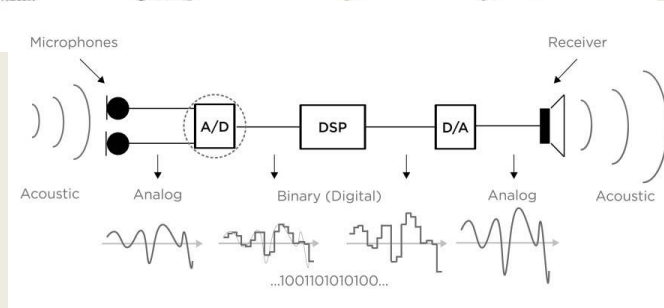
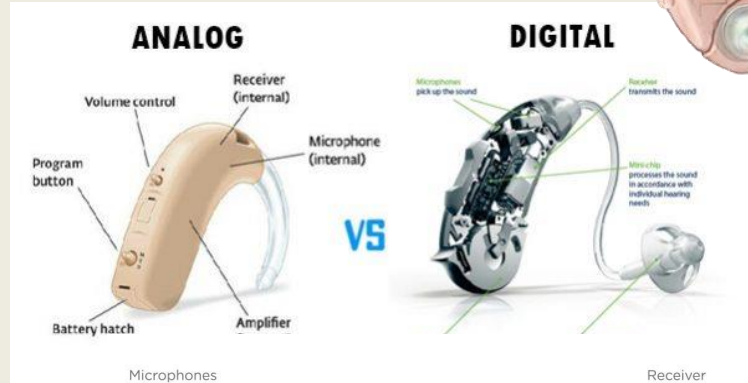
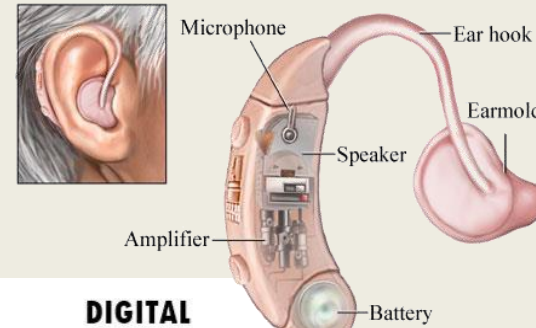
Incubators



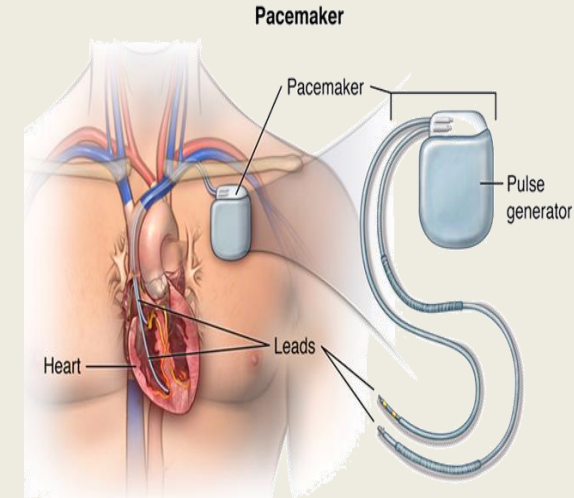
Ventilators



Hearing-aid

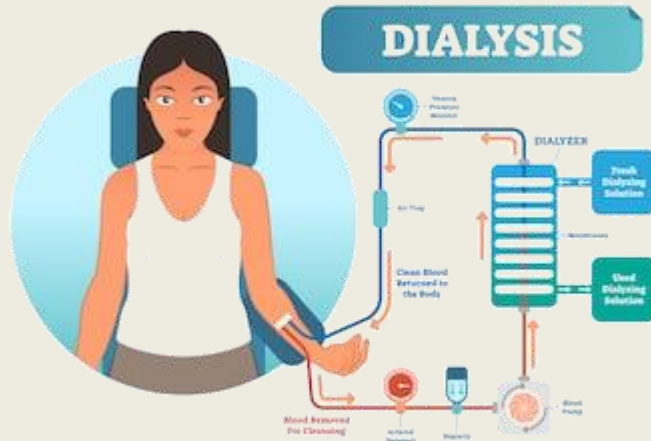


Pacemaker & ICD

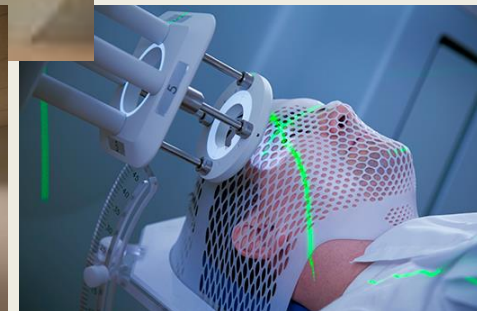
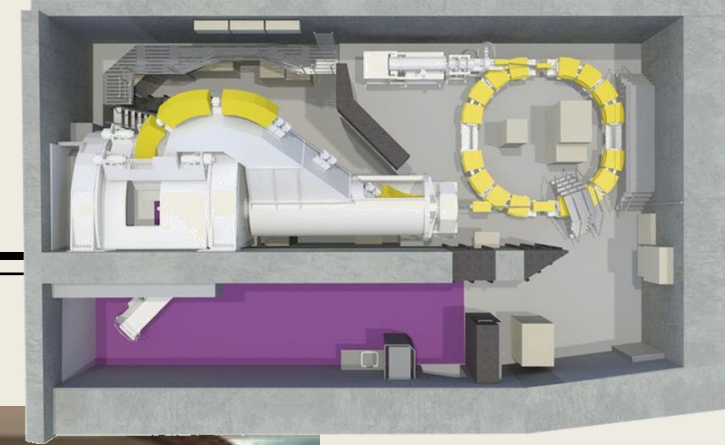


Treatment Devices

- Dialysis



- Radio-Therapy



Signal Processing

- ECG (heart waves)
- EEG (brain waves)
- EMG (muscles waves)

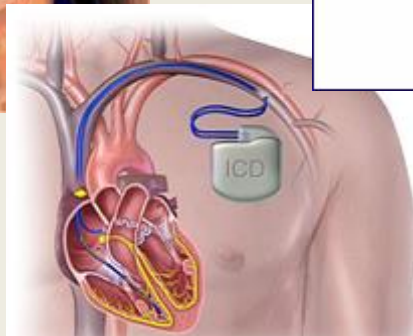
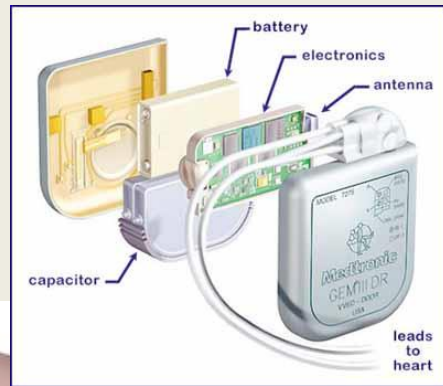
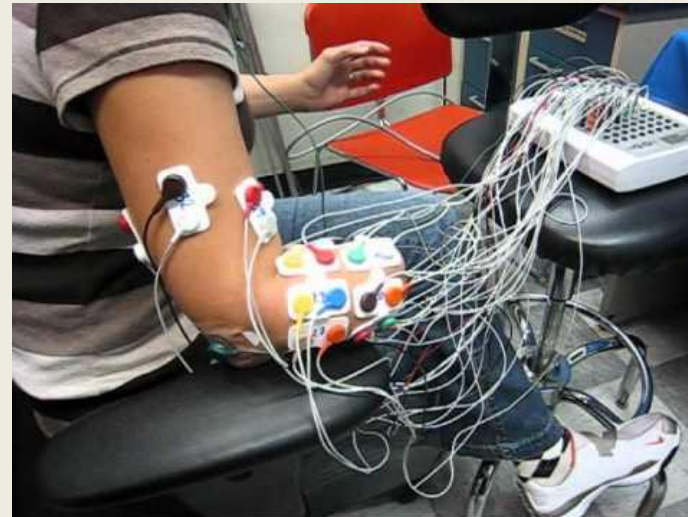
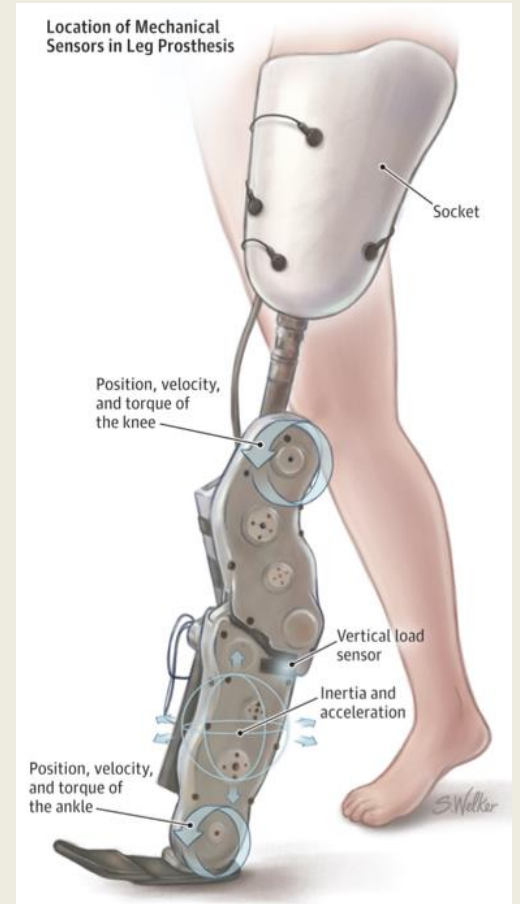
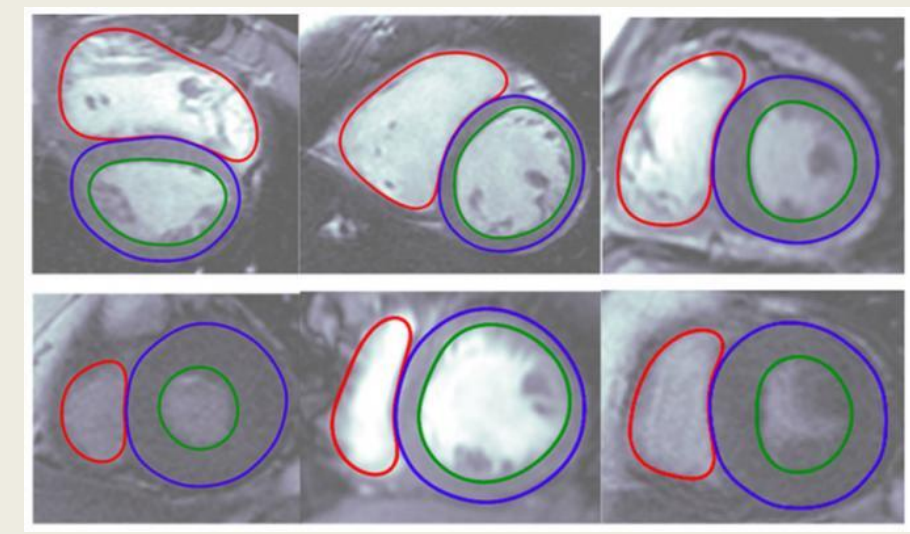
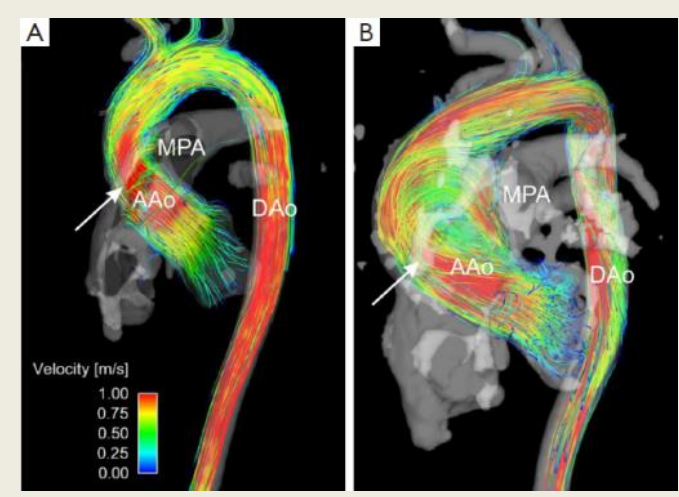
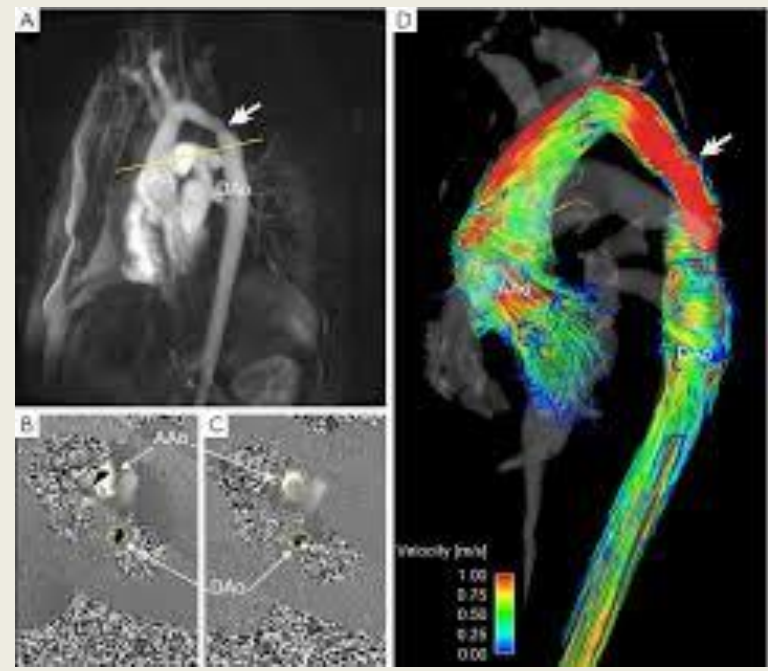
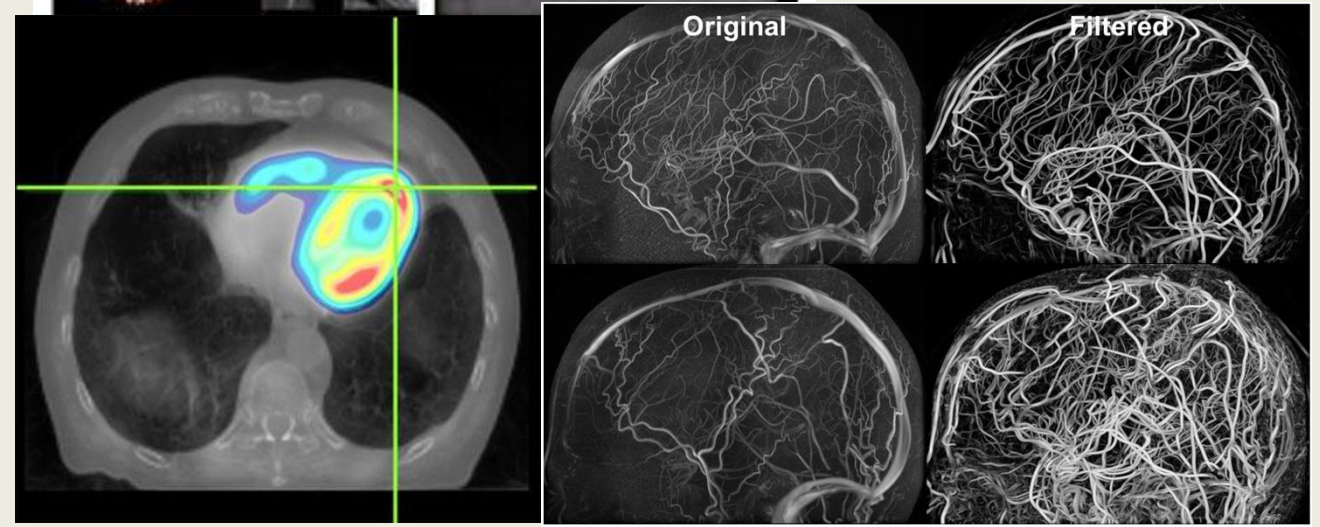
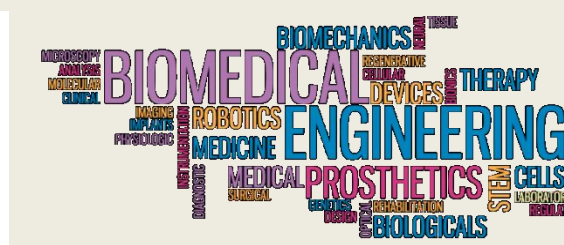
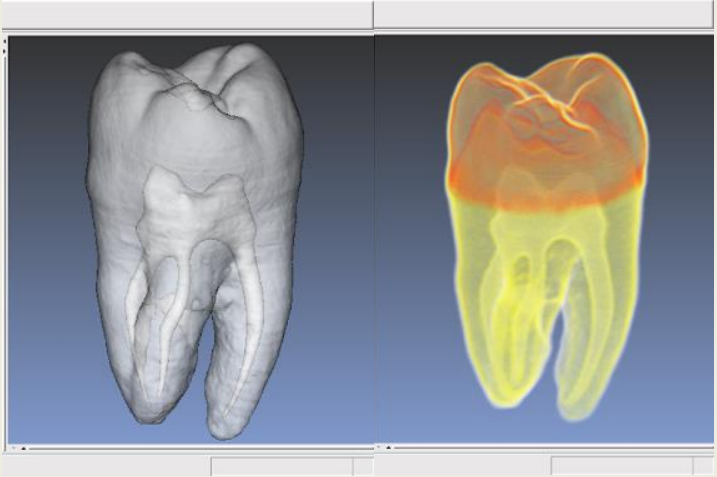
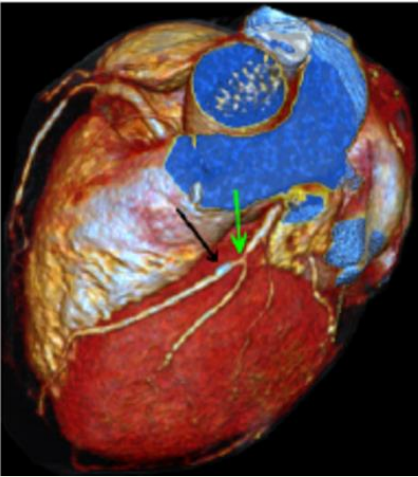
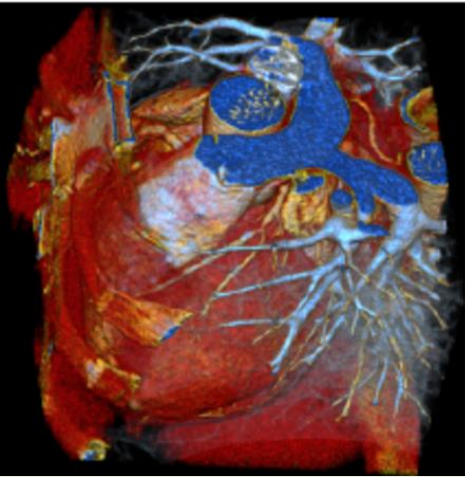
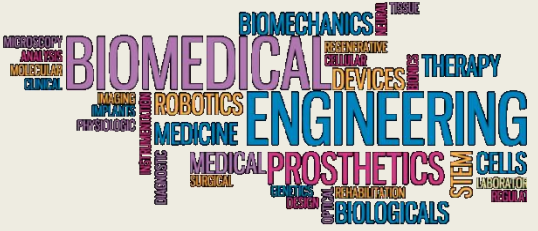


Image Processing & Computer Vision

- Pattern recognition,
- Big Data,
- Deep Learning.

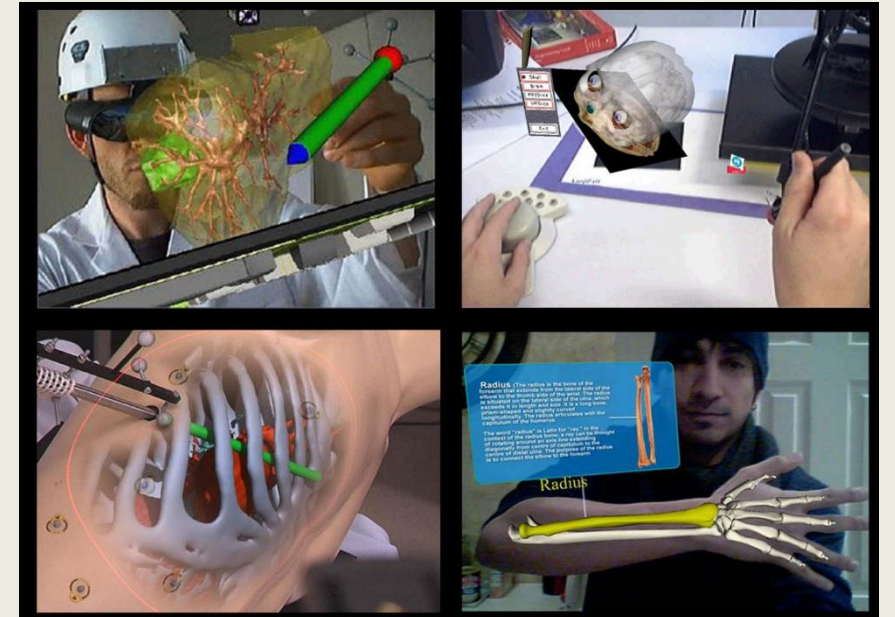


Visualization & Virtual & Augmented Reality

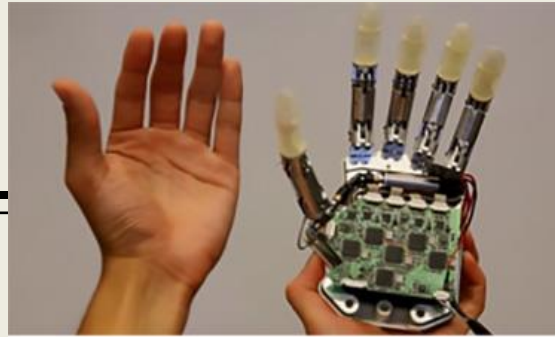
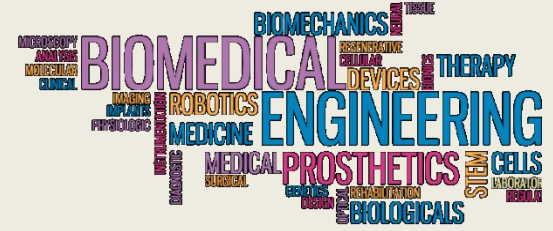


Visualization & Virtual & Augmented Reality

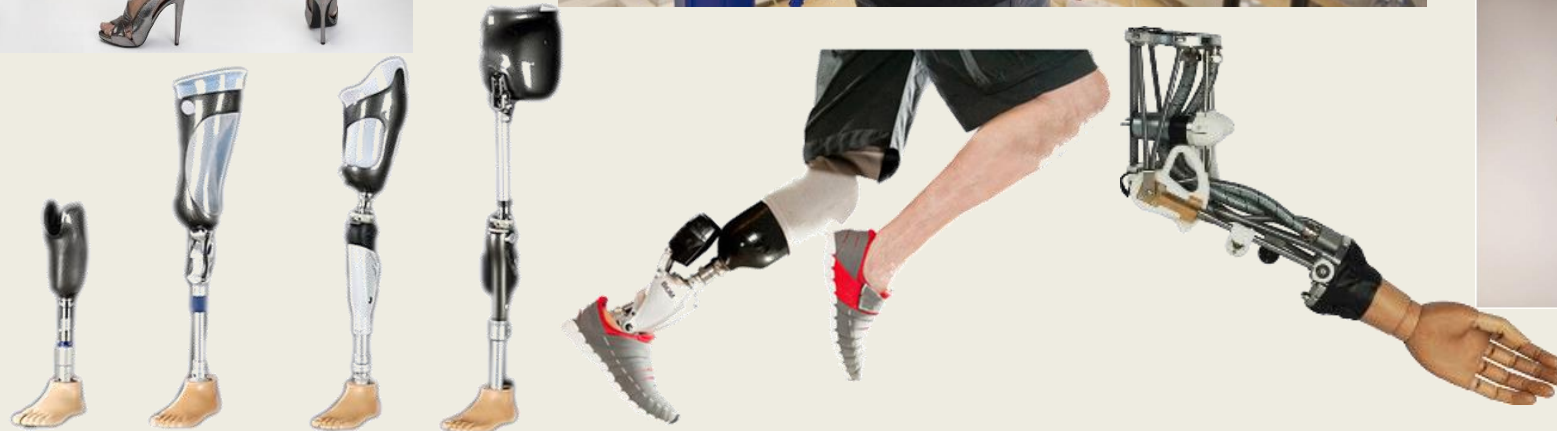
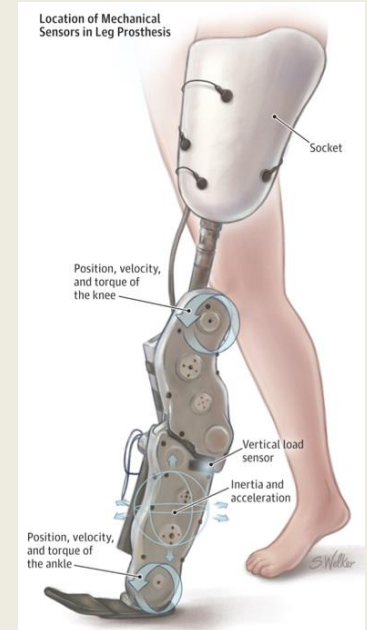
- Intervention surgeries



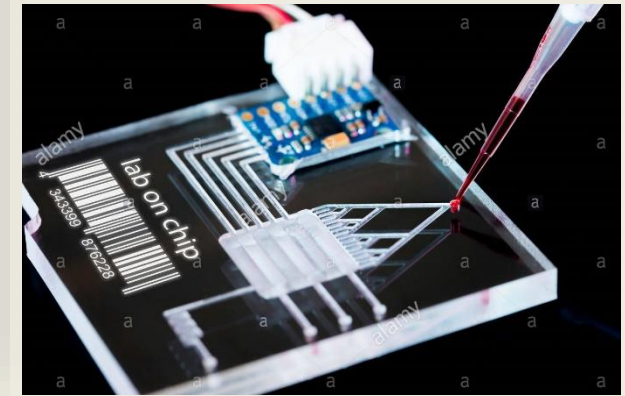
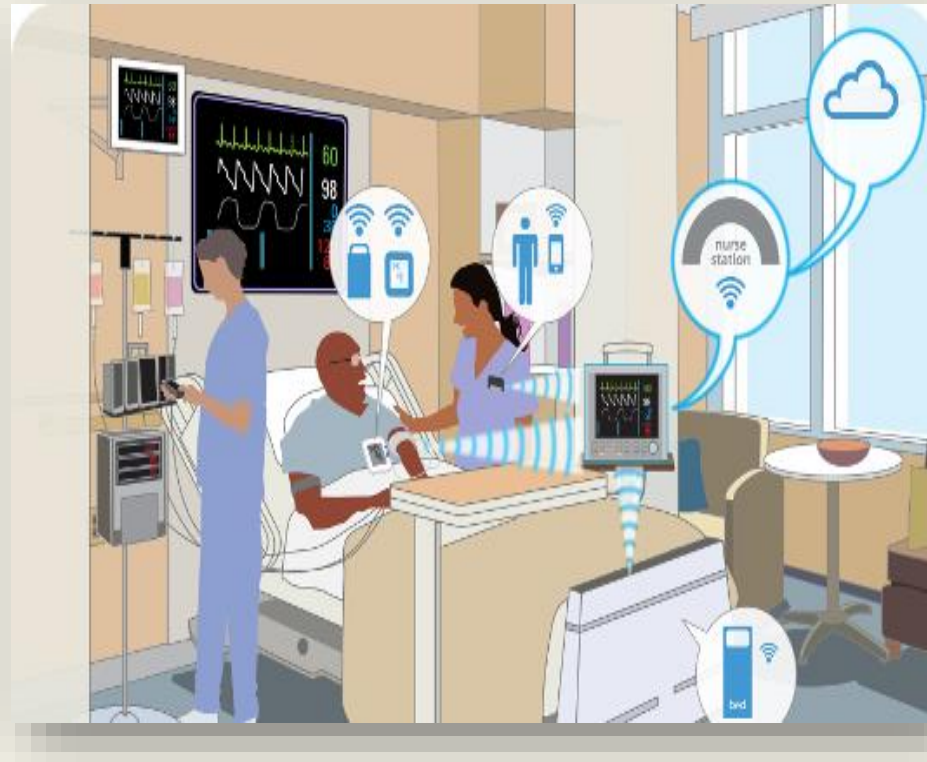
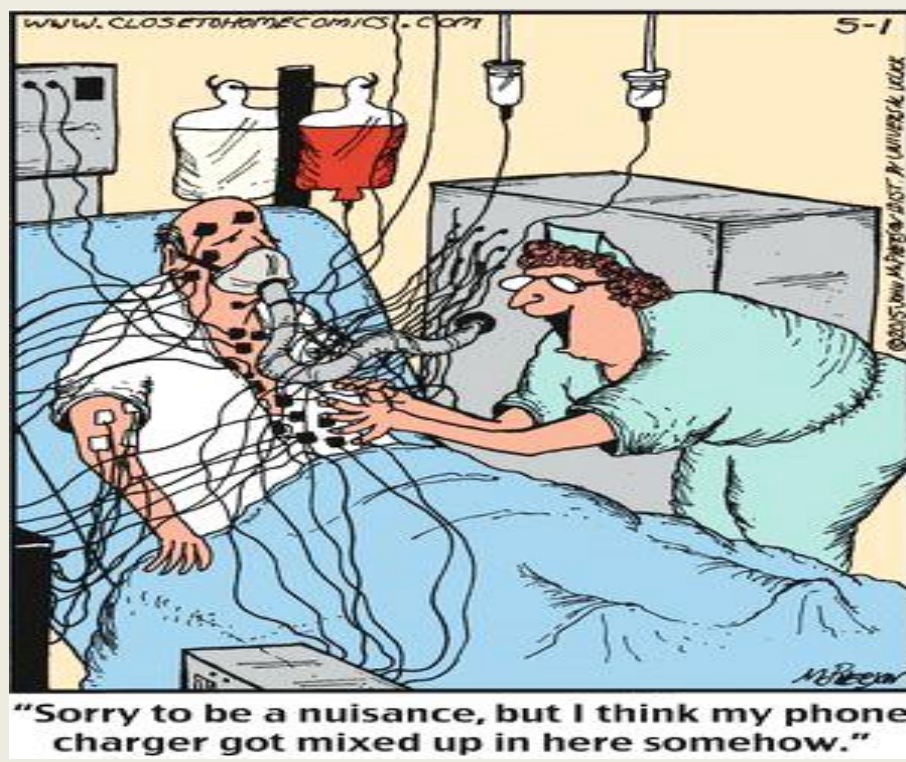
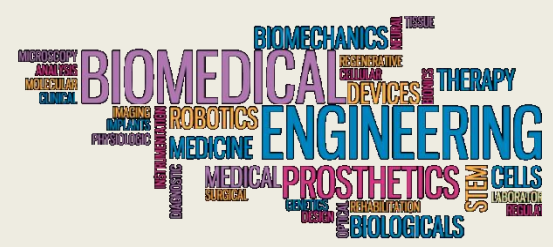
Mechatronics



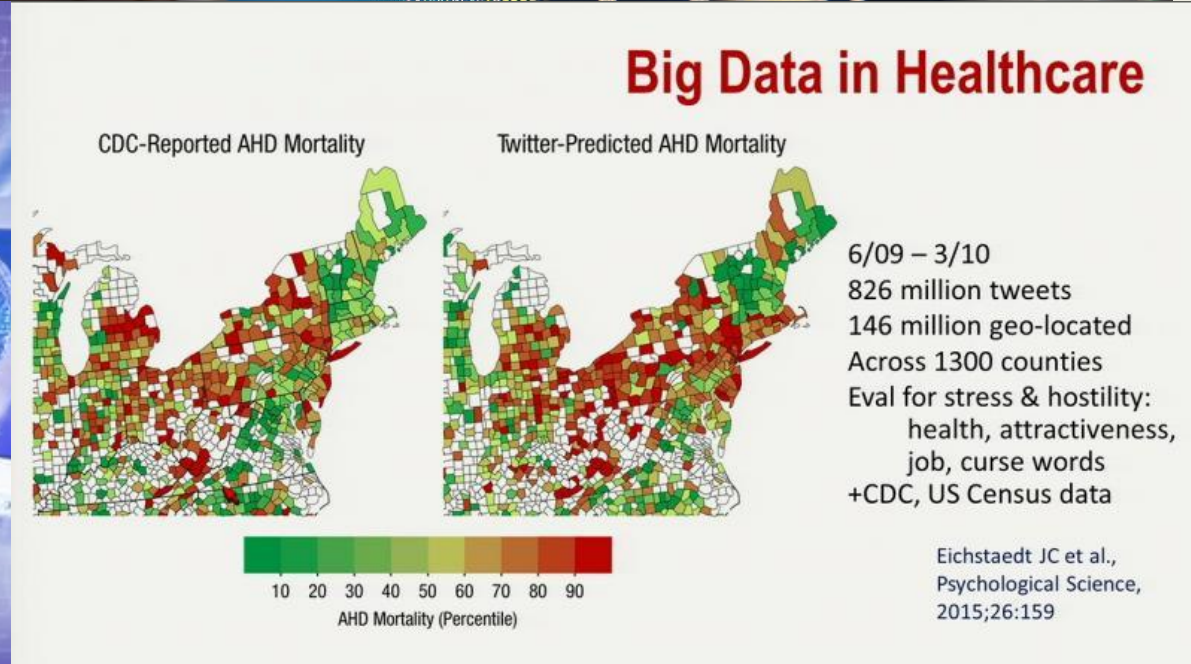
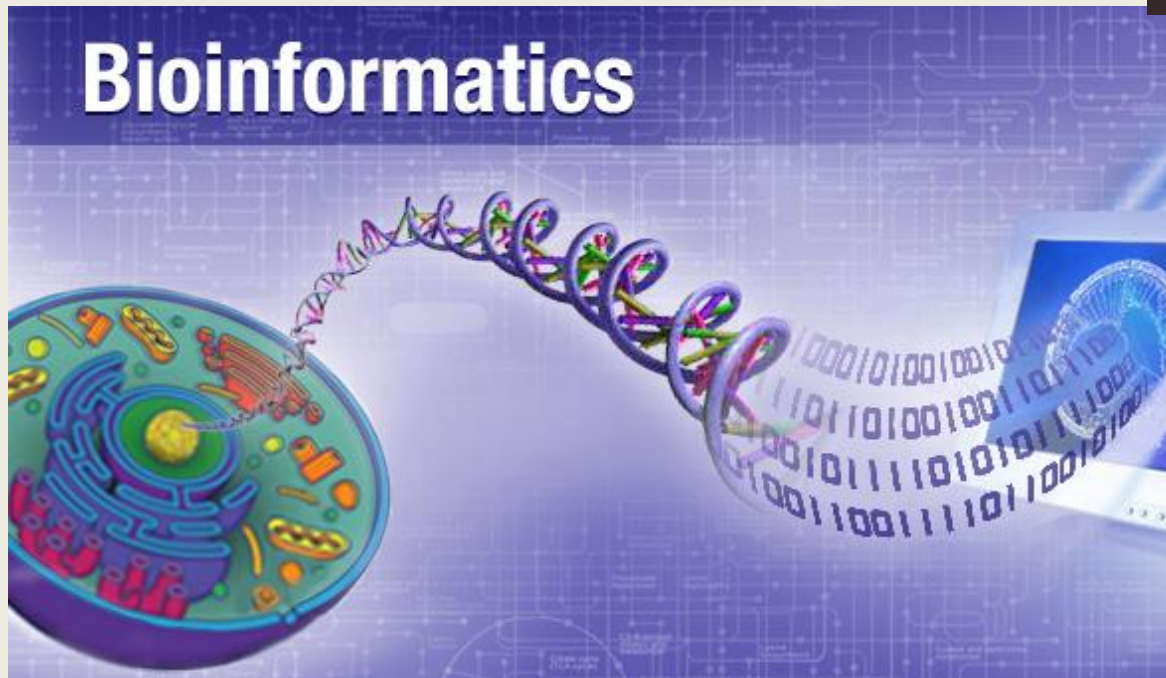
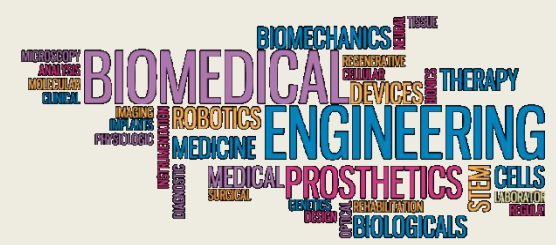
- Biomechanics, Rehabilitation, Orthopedic.
- Biomaterials, Tissue engineering.
- 3D printing and bio-fabrication, Prosthetics.

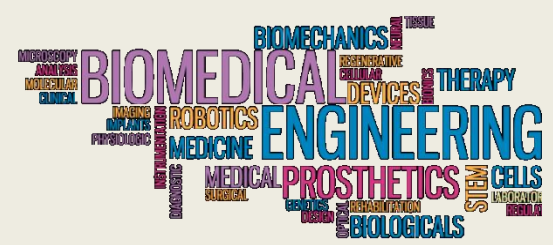


Tele-health, IoTs, Lab-On-A-Chip

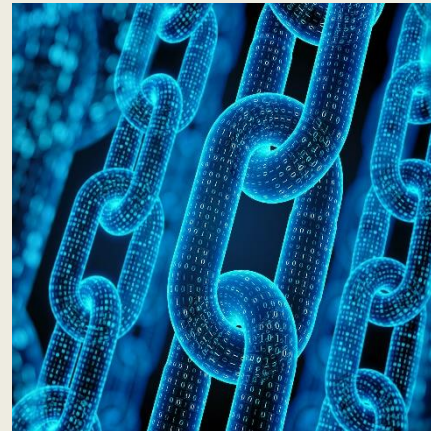
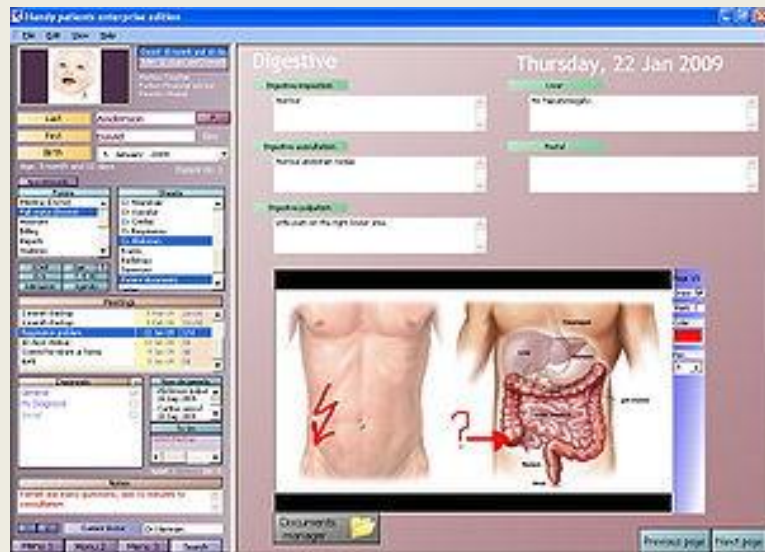
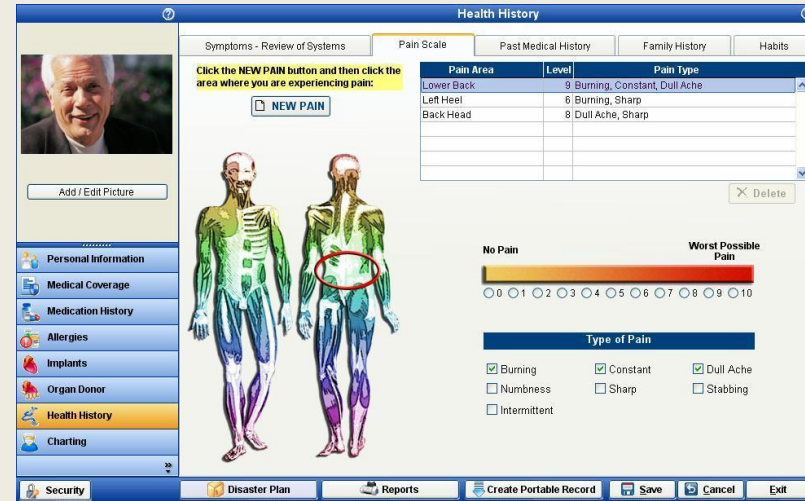
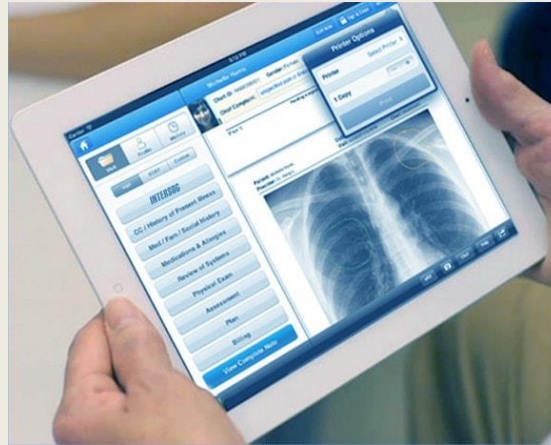


Bioinformatics, Genetic Engineering

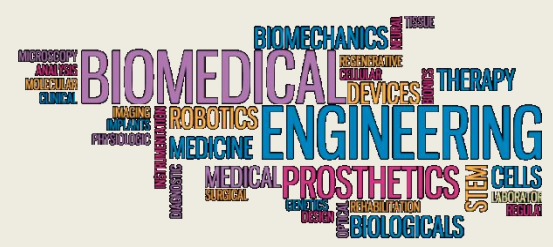




Health Informatics, Medical SW, Security/Privacy

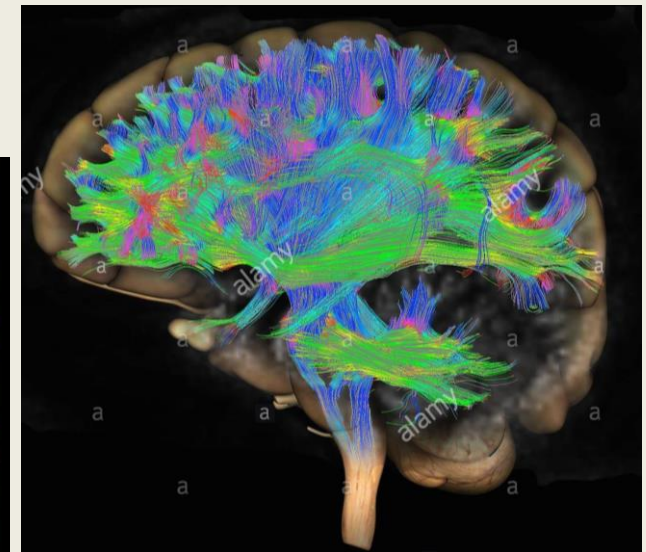
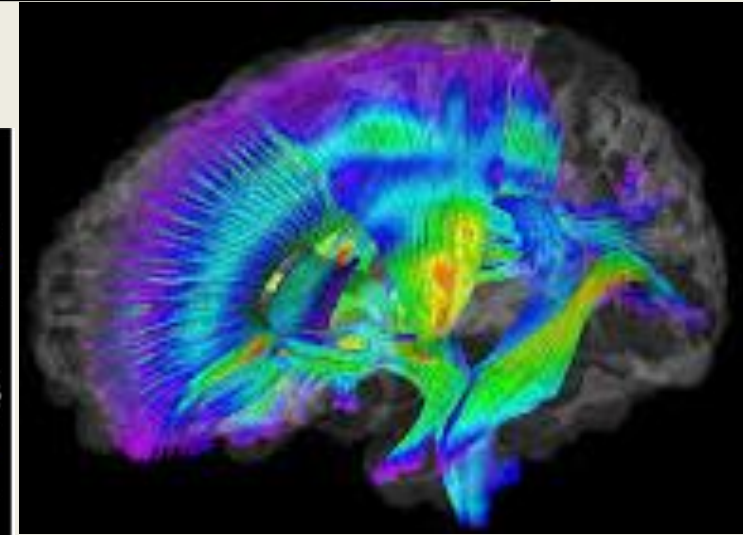
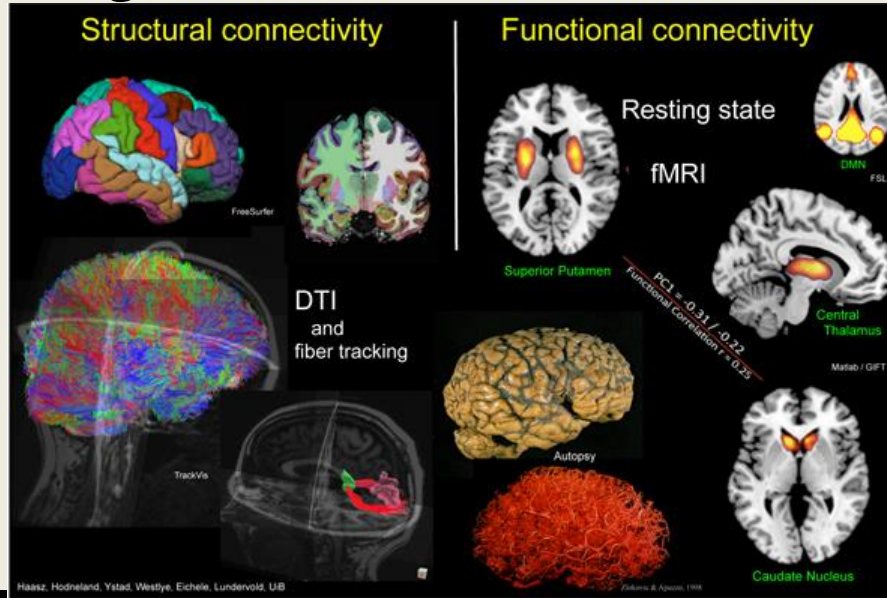
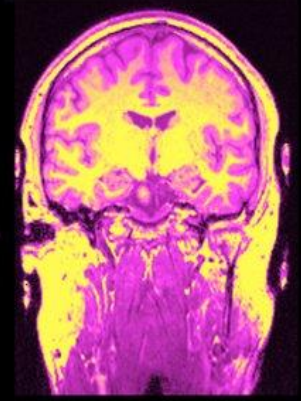
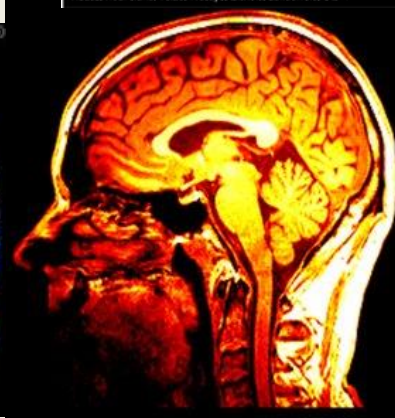
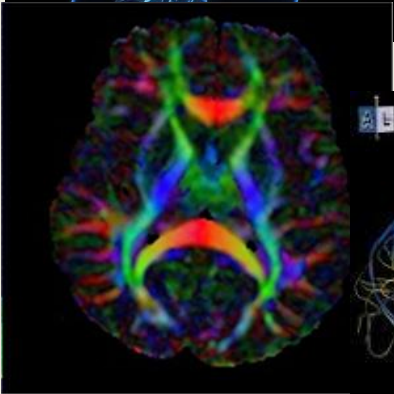
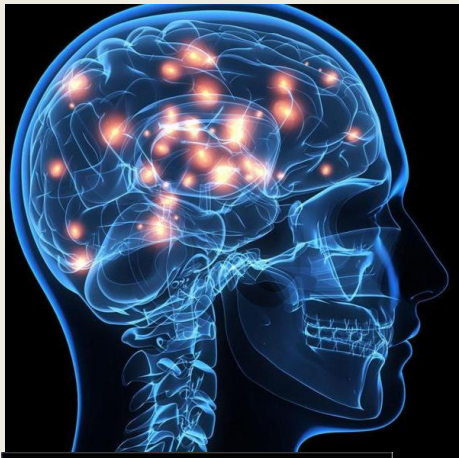


Clinical Engineering



Bio-Inspired Systems

- Systems Physiology (Neural Eng, Neuroscience, Computational modelling)



tamer.basha@eng1.cu.edu.eg

قسم هندسة طبية - الدور الثاني مبني عمارة

THANK YOU

Questions:

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More on biomedical field:

<https://www.youtube.com/watch?v=T1Win0bdrHw>

<https://www.youtube.com/watch?v=3QP2-bzlull>

<https://www.youtube.com/watch?v=xlUfHBhnb0>