



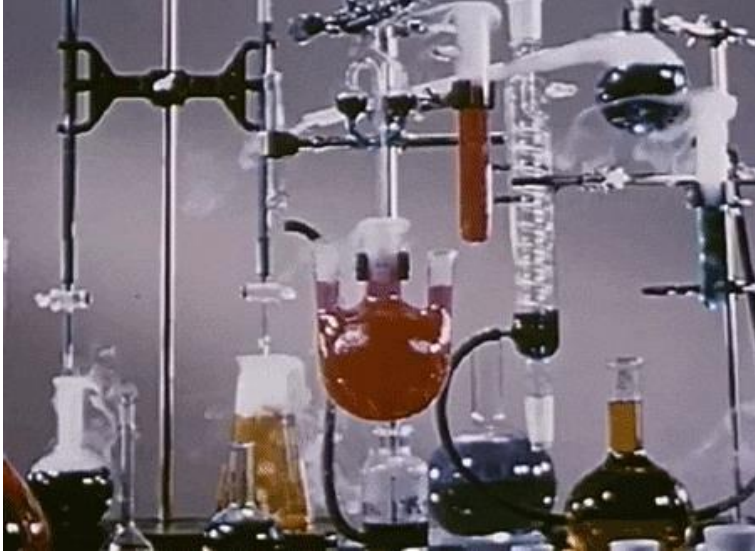
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# ORIENTATION TO PRE-ENGINEERING STUDENTS FEBRUARY 2024



# What is Chemical Engineering?

❑ Chemical engineering is an engineering field which deals with the **study of operation** and **design of chemical plants** as well as methods of improving production.



# What is Chemical Engineering?



Using principles of **chemistry**, **physics**, **biology**, **mathematics** and **economics**, chemical engineers **design equipment**, **processes** and **systems** to **refine raw materials** into **useful products** through chemical manufacturing.

| Major Courses                            |                                          |
|------------------------------------------|------------------------------------------|
| Module Title                             | Module Courses                           |
| Basic Engineering Skills                 | Engineering Biology                      |
|                                          | General and Inorganic Chemistry          |
|                                          | Applied Organic Chemistry                |
|                                          | Analytical Chemistry                     |
|                                          | Computational Methods (Numerical)        |
| Chemical Engineering Basics              | Principle of Chemical Engineering        |
|                                          | Engineering Thermodynamics               |
|                                          | Fluid Mechanics                          |
|                                          | Fluid Machines in Chemical Engineering   |
|                                          | Chemical Engineering Thermodynamics      |
|                                          | Mechanical Unit Operations               |
|                                          |                                          |
| Process Industries                       | Process Industries                       |
| Transport Phenomena & Separation Process | Transport Phenomena                      |
|                                          | Process Heat Transfer                    |
|                                          | Thermal Unit Operations                  |
|                                          | Mass Transfer Unit Operations            |
| Chemical Reaction Engineering            | Reaction Engineering I (Kinetics)        |
|                                          | Reaction Engineering II (Reactor Design) |
| Practical & Reporting Skills             | Technical Report Writing                 |

| Major Courses                       |                                         |
|-------------------------------------|-----------------------------------------|
| Module Title                        | Module Courses                          |
| Process Control and Instrumentation | Process Dynamics and Control            |
| Basic Environmental Engineering     | Basic Environmental Engineering         |
| Internship                          | Internship                              |
| Material Science and Engineering    | Material Science and Engineering        |
| Biochemical Science and Engineering | Introduction to Biochemical Engineering |
| Food Engineering                    | Principle of Food Process Technology    |
| Chemical Engineering Design         | Plant Design and Economics              |
|                                     | Chemical Engineering Apparatus Design   |
|                                     | Chemical Engineering Design Project     |
|                                     | Refrigeration and Air Conditioning      |
| Industrial and Business Management  | Industrial Health and Safety            |
|                                     | Project Management                      |
| Senior Project                      | Final Year Project I                    |
|                                     | Final Year Project II                   |

# Cement industry



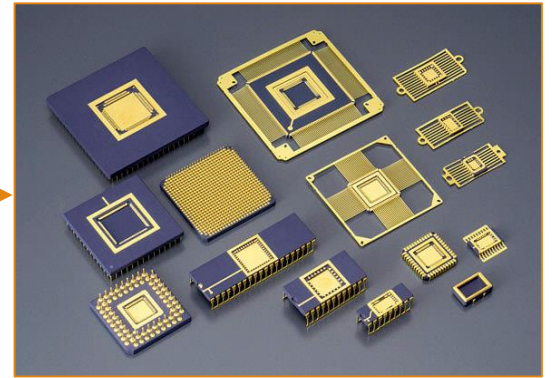
# Paint industry



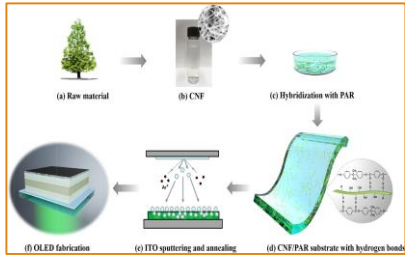
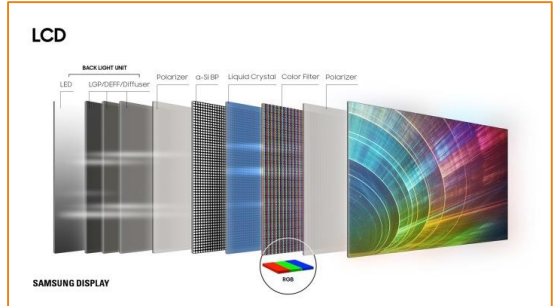
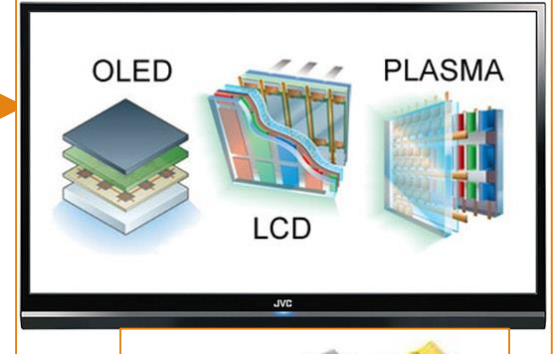
# Paper industry



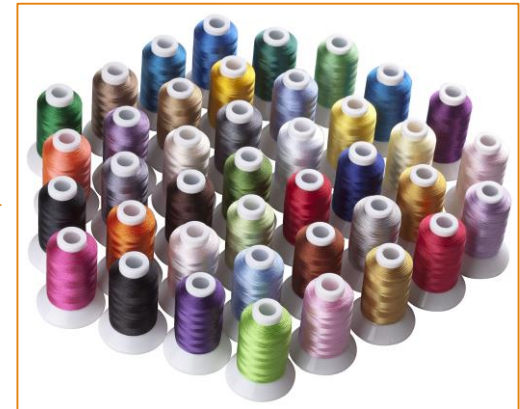
# Computer Chips industry



# Screen manufacturing industries



# Polyester industry



# Sugar industries



# Beverage industries



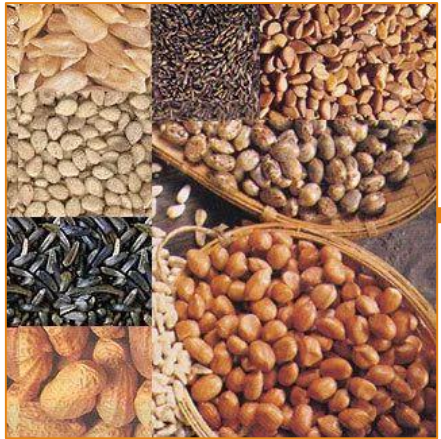
# Food industries



# Food industries



# Food industries



# Energy industries



# Energy industries



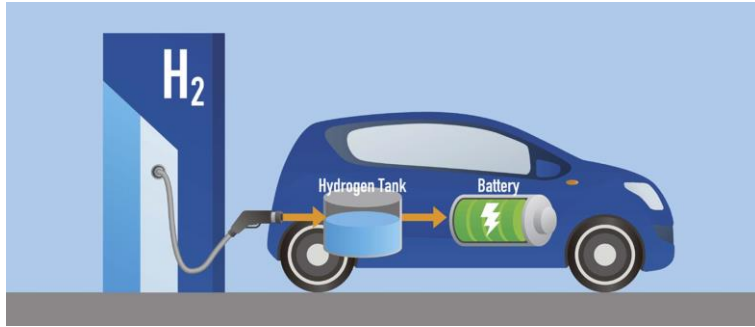
# Pharmaceutical industries



# Petroleum industry



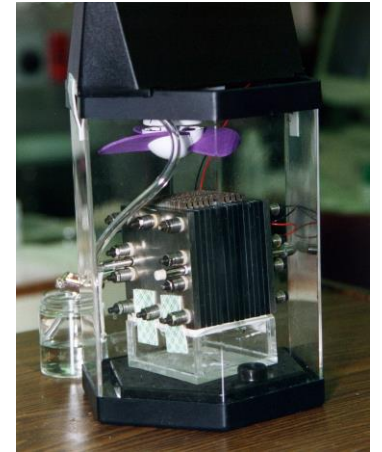
# Future of Chemical Engineering -Examples



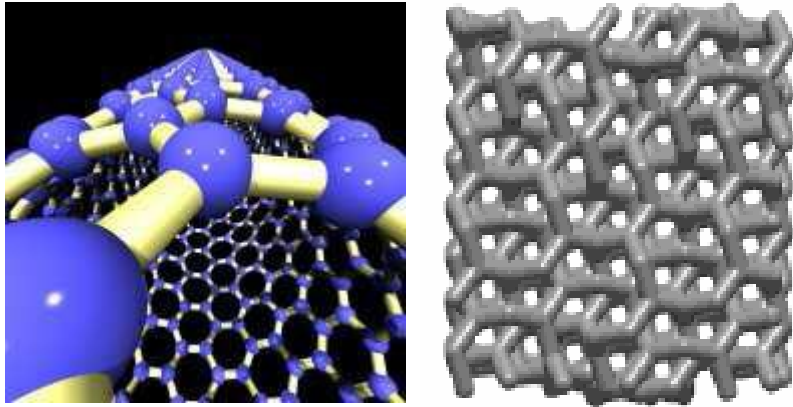
**Hydrogen fuel**



**Biotechnology**



**Methanol Fuel Cells**



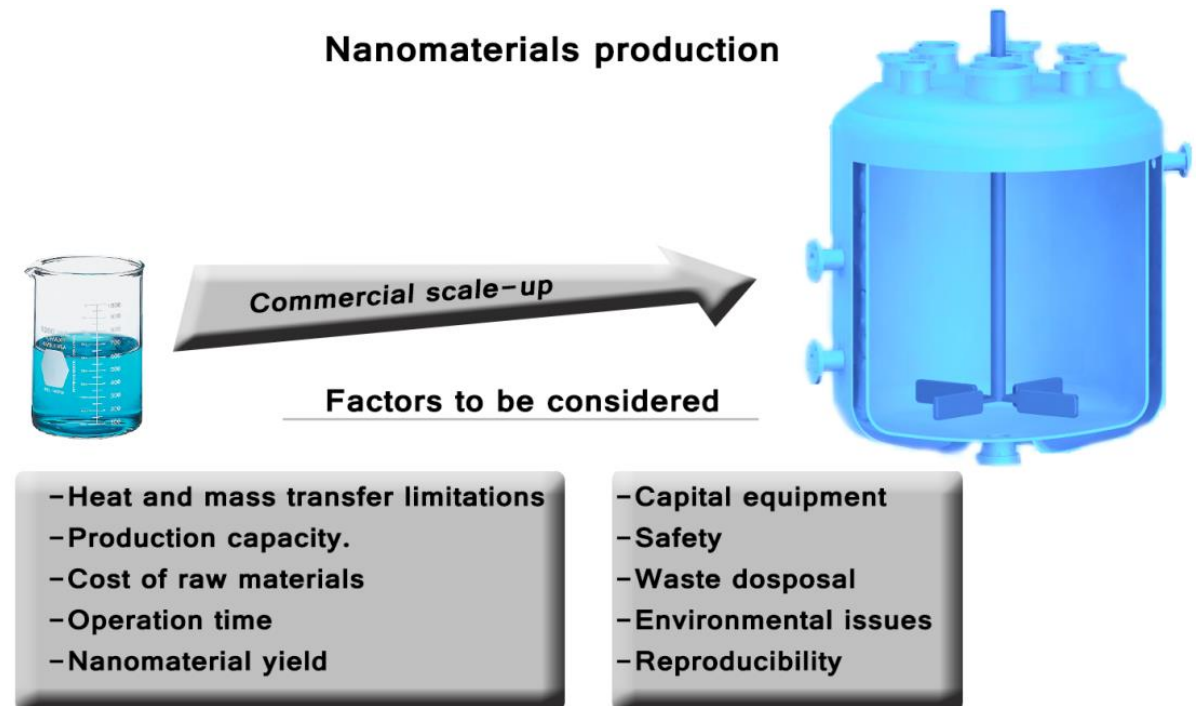
**Nanotechnology**



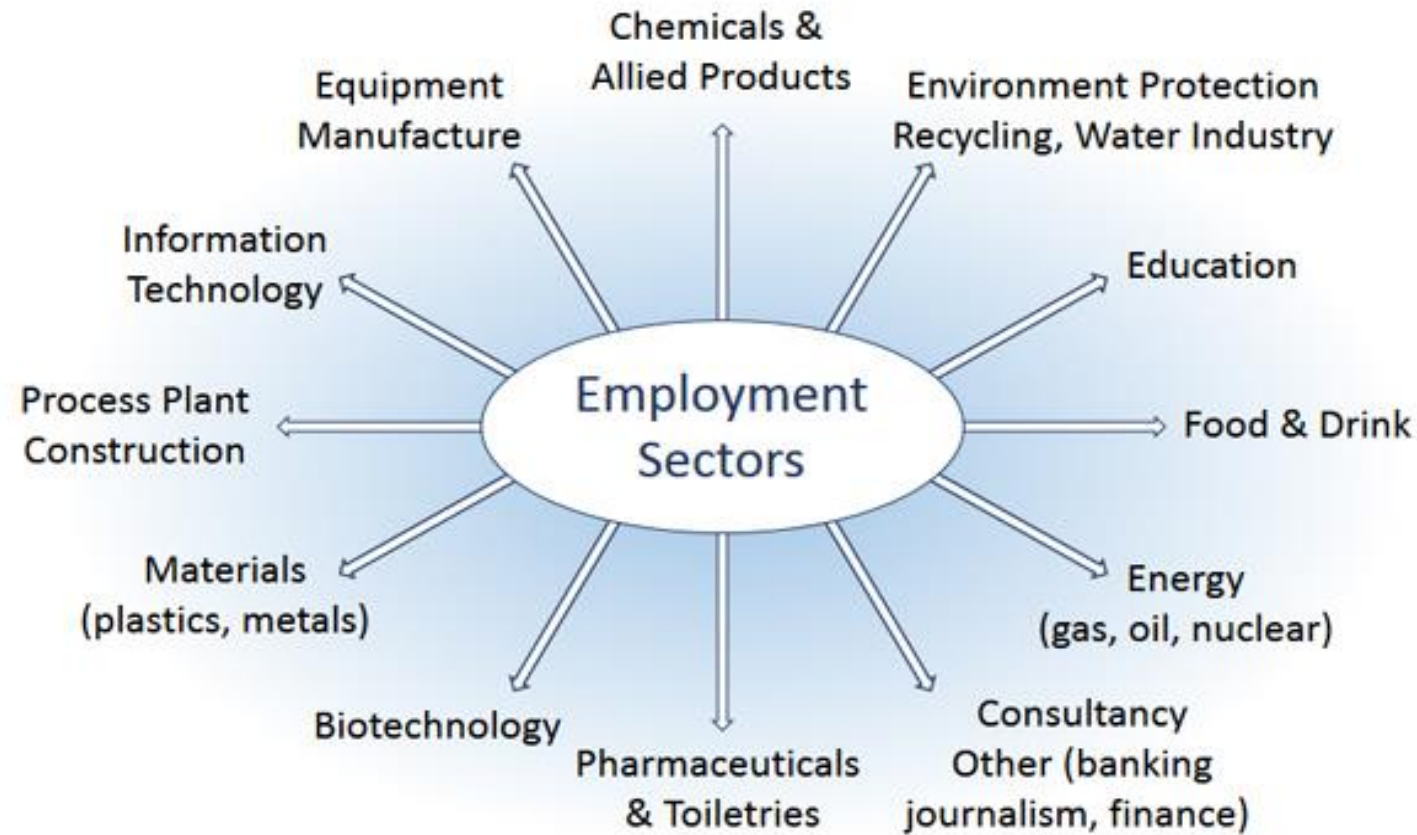
**Environment**

# Chemical Engineering work?

❑ Chemical engineers work with the **smallest scale nanomaterials** in a **laboratory** setting through to developing **large-scale, industrial production systems**.



# Professional Profile



# Chemical Engineering Area of Specialization

- Process Engineering
- Food Process Engineering
- Environmental Engineering
- Material Engineering
- Biochemical Engineering
- Biomedical Engineering
- Sustainable Energy Engineering
- Pharmaceutical Engineering
- Petroleum Engineering
- Mineral Process Engineering
- Nuclear Engineering
- Armament Engineering



# What consider for program selection

- ❖ Country situation (what is the gov. plan)
  - ❖ Self employee and entrepreneur
  - ❖ Future opportunity
  - ❖ Follow your dream
- 
- ❖ Information (senior student, instructors, ....) ....(avoid biased information)

# SCBE'S Resource (staff and Laboratory facility

## Staff

| Academic Rank       | Number |
|---------------------|--------|
| Professor           | 4      |
| Associate professor | 10     |
| Assistant Professor | 11     |
| Lecturer            | 46     |
| Technical Assistant | 12     |



# Most of our course are integrated with laboratory work



# Laboratories

- ❑ Chemical reaction engineering
- ❑ Mineral and Construction input material laboratory
- ❑ Thermal unit operation
- ❑ Mass transfer unit operation
- ❑ Mechanical unit operation
- ❑ Environmental engineering
- ❑ Food engineering
- ❑ Analytical Laboratory
- ❑ Biochemical Laboratory



# International Partnership

- University of Cagliari, Canada
- Stellenbosch University , South Africa
- Hochschule für Technik und Wirtschaft (HTW) Berlin, Germany
- Case Western Reserve University, USA
- University of Toulouse, France.
- Cumhuriyet University, Turkey
- Deutsches Biomasseforschungszentrum (DBFZ, German Biomass Research Center), Germany
- STEMPower, USA
- Dow Chemical, USA
- China AID, China



# Thank you

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When writing the  
story of your life,  
don't let anyone  
else hold the pen.