Introduction to Industry

Syllabus Number 3I210
Special Subjects
Requisites 2 credit
Each Staff

1. Course Description

Students will learn basic knowledge and technology such as machinery, electricity, chemistry, civil engineering, and construction to be able to respond to industrial technology. And they understand the characteristics of various industrial fields and acquire comprehensive ability to solve industrial technology problems.

2. Course Objectives

Students can gain a comprehensive understanding of engineering by studying machinery, electricity, chemistry, civil engineering, and architecture.
Students will be able to explain the necessary knowledge and skills as future engineers and technical teachers.
Students acquire the qualities of teachers who understand the significance of industry.

3. Grading Policy

Students will be evaluated at 60% regular report and 40% report only if all reports are submitted.
Feedback and added explanations about points to be corrected when returning the report.

4. Textbook and Reference

Reference
Ministry of Education, Culture, Sports, Science and Technology High School Study Guideline Explanation Industry Edition (July 2018) Jikyo publication

5. Requirements(Assignments)

Please print the High School Study Guidebook Explanation the Industrial Edition and read it carefully. (90 minutes each time)

6. Note

Prepare a scientific calculator, because you may practice math problems.

7. Schedule

[1] Guidance and the significance of introduction to Industry (by Y. Hasuda)
Commentary on the importance of modern manufacturing and problem solving skills.
Understanding the significance of collaborated industrial technology

[2] Electric and electronic engineering (1): Basic concepts of electric and electronic circuits. (Dr. Kobayashi at IEE)
You will understand basic electrical theories such as Ohm's law and Kirchhoff's law, alternating current theories, basic theories of semiconductor, and semiconductor devices such as transistors.

[3] Electric and electronic engineering (2): Present status of electric and electronic engineering. (Dr. Kobayashi at IEE)
You will understand the present status of electric machinery, control technology, advanced semiconductor devices, and communication technology.

[4] Mechanical Engineering(1): Material Mechanics and Machine Element
Understand the basic matters of material mechanics necessary for mechanical design, such as Hooke's law, elastic modulus, fracture, and safety factor, through screws, which are typical mechanical elements.

[5] mechanical engineering (2)
The development of the history of mechanical engineering (Mechanical and Precision Systems: Hino)
History of Mechanical Engineering. Machine tool. Environment and Energy.
Mechatronics technology supporting society.

[6] Applied Chemistry Engineering (1) :
Surface treatment in jet engines (Department of Aerospace Engineering Satoshi Yamada)
The techniques of aerospace surface treatment will be studied using photographs (of surface treatment processes, etc.) of actual jet engines with which aircraft such as the Boeing 747 (Jumbo Jet) are equipped.

[7] Applied Chemical Industry (2): New materials that have developed the industry.
The purpose of this lecture is to acquire the acknowledgment concerning the new materials such as plastics and composite materials (CM) that have developed the industry

[8] Civil and Environmental Engineering: Civil and Environmental Engineering that Supports the Foundation of Life (by M.Tateishi)
Surveying methods and civil engineering such as structural materials and disaster prevention systems.

[9] Engineering Materials : Categorizations and characterizations of engineering materials (Aerospace Hashimoto)
Fundamentals and applications of carbon steel, duralumin, titanium alloy and composite material will be discussed.

[10] Information Science: Information and Communication Technology (ICT)
CPU(Central Processing Unit) and ICT-based learning system.

[11] Architecture: Architectural Design and Safety (by M.Tateishi)
Students will be understand architectural design, earthquake resistance, livability and safety, the current state of barrier-free, and sick house measures.

[12] Fusion engineering (1)
Mechatronics technology. The robot supports reduction and aging of the present condition of an industrial robot, or a farm population as a fusion example of the advanced engineering case (Mechanical and Precision Systems: Hino)
Machine electron seen by mechatronics and the robot.

[13] Applied Engineering: Examples of state-of-the-art technology in medical-engineering collaboration (by M. Ogawa)
This class is about the medical-engineering collaboration field and state-of-the-art medical devices such as ECG, CT scanner, OCT and so on.

[14] Fusion Engineering(3)
Basics of Automotive Safety Design and Status of Latest Technology(MEC:Makita)
Understand how to reduce injuries to occupants and pedestrians with a car body and occupant protection devices (seat belts, airbags, etc.) in the event of a traffic accident.

[15] Tests and Summary