스마트산업안전학과

**(Department of Smart Industrial Safety)**

**1. Department Introduction**

In recent years, the industrial structure is having highly sophisticated technique, changing to more complicated, and facing a time to transit from traditional to information technology (IT) based operation of the contents. To cope with a trend, the department of smart industrial safety (SIS) is established. For the top quality educations and researches opportunity for the students, the SIS provide practice based educations through a convergence of engineering, jurisprudence, public administration, and other necessary ones.

**2. List of Faculty Members**

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| --- | --- | --- | --- | --- |
| Position | Name | Last School Graduated | Degree | Major |
| Professor | Lee, Kwang Sik |  Yeungnam Univ. | Ph.D | Electric Power Engineering, Discharge Engineering |
| Professor | Kim, Dong Hee | Kobe Univ. | Ph.D | Power Electronics |
| Professor | Park, Won Zoo | Kyushu Univ. | Ph.D | Plasma Engineering |
| Professor | Kim, Ki Chai | Keio Univ. | Ph.D | Electromagnetic Wave Engineering, EMI/EMC |
| Professor | Lee, Hai Young | KAIST | Ph.D | Process Control & Diagnosis |
| Professor | Seok, Jul Ki | Seoul National Univ. | Ph.D | Power Electronics |
| Professor | Park, Yeong Mog |  Saga Univ. | Ph.D | Geotechnical Engineering |
| Professor | Hawong, Jai Sug | Kanto Univ. | Ph.D | Experimental Mechanics and New Material Technology, Fracture Mechanics, Biomechanics |
| Professor | Kim, Chong Gun |  University of Electro-Communications | Ph.D | Distributed Computer System, Networks |
| Professor | Park, In Soo | Paris II Univ. | Ph.D | Constitution |
| Professor | Kim, Yul | Ohio State Univ. | Ph.D | Research Methods, HRM, Local Finance |
| Professor | Jee, Hong Kee | Dongguk Univ. | Ph.D | Hydraulic Engineering, Water Resources Engineering |
| Professor | Shu, Jung In | Univ. of Tottori | Ph.D | Environmental Engineering and Planning |
| Assistant Prof. | Rhee, Sang Bong | Hanyang Univ. | Ph.D | Power System Analysis & Operation |

**3. Academic programs**

* Ph.D Programs
* Master Degree Programs

**4. Course Description**

■ 기초공통(Basic Major Courses)

**건설안전공학 3 credit**

**(Construction Safety Engineering)**

The objective of lecture is to develop and expand engineering principles of inherently safer design for construction. To accomplish this, this lecture will draw from four pioneering approaches to safer design. These approaches are to eliminate the hazard by improving the design of the facility to be constructed and the equipment to be used in the task, select safe methodology, provide safety factors to minimize the hazard, and provide redundancy with several safeguards to confine the hazard.

**기계설비안전학 3 credit**

**(Mechanical Safety Engineering)**

This lecture provides technical improvements and hazard elimination methods for mechanical safety. The mechanical safety schemes are based on human interface problems and analysis of mal-operation of the machinery.

**산업안전법규 3 credit**

**(Industrial Safety Law)**

The aim to learn the acts relating industrial safety and health is for students to enhance the ability that they can deploy industrial accident prevention program scientifically, systematically, comprehensively and autonomously.

**산업안전행정 3학점**

**(Industrial Safety Administration)**

The Occupational Safety and Health (OSH) administrative system is regarded as one of the critical determinants of the effectiveness of industrial safety efforts. This course is designed to introduce the general concept of the OSH administrative system, which consists of organizational structures, policy making and implementation, program assessment and evaluation, and the development of better management regarding industrial safety regulations.

**인사행정론 3 credit**

**(Public Personnel Administration)**

How well government works depends fundamentally on the quality of public employees and on how completely their talents and energies are put to use. This course aims at comprehensive understanding on the basic theory and practice of public personnel administration, which is to attract and identify competent people for government positions, to design work, and to provide a setting that encourage employees to work energetically, creatively, and ethically.

**전기안전공학 3 credit**

**(Electrical Installation Safety Engineering)**

This course helps students to grasp the fundamental measures of safety accidents such as electrical insulation of transmission and distribution line, earth system, etc., and provides lectures on operation of electrical installation.

**전자파공학특론 3 credit**

**(Advanced Electromagnetic Wave Engineering)**

The point of this lecture, starting from the Maxwell Equations, is a full understanding of an elementary knowledge for the electromagnetic wave engineering and the application of various branches of electromagnetic wave. This class is treated of the Maxwell equations, the medium equation, the solution of wave equation, a radiation of electromagnetic wave, and basic of antennas.

**컴퓨터 및 네트워크 보안개론 3 credit**

**(Computer and Network Security)**

In current information based industrial environment, secure cooperation among computers and networks by using stable management against the malicious attack intents is very important. Especially, distribution of malicious codes, illegal information acquisitions, and threats and attacks to network resources must be protected by counterplan of security. Effective and stable technologies for protecting those threats and attacks might be understood and applied in the practical computer networks. This lecture make the students understand the concept and the points of various malicious code, threats and attacks to computer and network. They can also understand effective and stable protecting technologies and learn detail practical methods against to threats and attacks on the computer and networks.

■ **Major Courses**

개별연구(1) 3 credit

(Independent Study (1))

개별연구(2) 3 credit

(Independent Study (2))

특수문제연구(1) 3 credit

(Special Study (1))

This course is for the student who is pursuing a Master, Ph.D. degree. The thesis advisor guides his/her study to carry out the research in desirable direction by providing theoretical backgrounds and current research trends.

특수문제연구(2) 3 credit

(Special Study (2))

This course is for the student who is pursuing a Master, Ph.D. degree. The thesis advisor guides his/her study to carry out the research in desirable direction by providing theoretical backgrounds and current research trends.

■ **스마트산업안전전공 (Smart Industrial Safety Major)**

**가스안전공학 3 credit**

**(Gas Protection Engineering)**

In industry area, a gas is highly used for the energy resource. Simultaneously with using the gas, there are many accidents occurs. This lecture is intended as a guideline for gas explosion protection aspects of safety accident prevention and managing skill.

**감전사고방지공학 3 credit**

**(Electric Shock Protection Engineering)**

This course analyzes and studies physiological effects on the human body by electric shock through electric current quantity, electric shock time, and electric current path, etc. The lecture also includes agenda on prevention measures of electrocution.

**건설안전진단특론 3 credit**

**(Advanced Safety Inspection for Construction Work)**

Inspection for construction work is the most effective means of identifying hazardous conditions at the worksite and growing up of its importance. Inspection for construction works identify hazards and give an opportunity to fix problems before injuries and accidents can occur. Construction sites require constant monitoring and observations to keep ahead of safety issues. This lecture provides objectives, necessary conditions, and related contents of safety inspection for construction work.

**공정자동화설비안전공학 3 credit**

**(Automation Facility Safety Engineering)**

This course treats several core techniques to design a safe process automation system for various kinds of industrial process such as iron & steel making, water treatment, paper etc. Main topic includes safety problems among automation systems, automatic diagnosis technique, and design technique of safe automation system.

**교통안전특론 3 credit**

**(Advanced Traffic Safety Engineering)**

Traffic safety engineering is core course of transportation engineering. The accident of vehicles causes human injury, metal disorder, and economic losses. This lecture provides main facts of accidents, planning of reform method, facilities, guideline, and training of safety.

**방전고전압공학 3 credit**

**(Electric Discharge and High Voltage Engineering)**

This course provides lectures on discharge mechanism of gas, liquid, and composite insulator under high voltage and application of high voltage engineering.

**산업안전정보학세미나 1 credti**

**(Seminar)**

This seminar provides broad knowledge about many fields of Industrial safety information. Various subjects are selected which are currently hot issues in Industrial safety and invited talks are given about the selected subjects.

**소방전기학특론 3 credit**

**(Advanced Fire Protection Electricity Engineering)**

The fire protection electricity is main facilities for prevention of fire spread and help for reducing the loss of damage when fire in occurrence. This lecture provides theories of fire protection electricity and treating method for an occurring of fire.

**소방행정특론 3 credit**

**(Advanced Fire Administration System)**

This lecture provides the information of necessary administration aided system for effective operation and building method of fire protection system.

**수자원안전관리 3 credit**

**(Water Resources Safety Management)**

The Water safety management will broaden the learning experiences and professional opportunities of students in technical disciplines who have an interest in engineering technology courses related to water treatment, construction, and industrial field.

**연소공학 3 credit**

**(Combustion Engineering)**

To prevent of safety accidents of gas application area, this lecture provides important combustion technology. And educate analysis methods of combustion reaction in electric furnace to have fundamental knowledge and skill for prevention of accidents in industrial field.

**옥내소방설비특론 3 credit**

**(Advanced Indoor Fire Systems)**

This lecture provides quality installation solutions for thermal & smoke detection systems, automatic fire sprinkler system, and emergency warning & intercommunication systems.

**전기방폭공학 3 credit**

**(Electrical Explosion Protection Engineering)**

This lecture provides theoretical approach method of the electrical explosion. To train a student, test method and fixing method for adaptation of explosion mechanism will be educated and discussed.

**전기설비안전특론 3 credit**

**(Advanced Electrical Installation Safety)**

This course helps students to grasp the fundamental measures of safety accidents such as electrical insulation of transmission and distribution line, earth system, etc. For the safety operation, provides lectures on legal installation of electric facilities and power system protection method when fault occurred.

**전력계통보호 3 credit**

**(Power System Protection)**

Synchronous machine, transformer, loads, and transmission lines are the main essentials of electric energy system. For optimal operation of these components, detailed modeling and the firm understandings of the steady and dynamic characteristics of the energy system are needed. In case of power system failure, the system components should be treated correct protection schemes. In this lecture, the general survey of components modeling, protection coordination, and energy systems will be provided.

**전식방식공학 3 credit**

**(Electric Corrosion Engineering)**

The lecture covers especially an outline of corrosion mechanisms, basic electrochemical theory of corrosion, corrosion in liquid media, atmosphere and gases. Also, provide the methods to student about electro-chemical protection of corrosion and corrosion testing.

**전자기환경공학특론 3 credit**

**(Advanced Electromagnetic Compatibility)**

From this lecture, students can learn that electrical and electronic devices and systems can be sources of electromagnetic noise and can be affected by noise from other devices and systems at the same time. And they can learn EMC/EMI required to make harmonious electromagnetic environment among electrical and electronic devices and systems. In detail, students learn components of electromagnetic interference, properties and characteristics of electromagnetic noise source, devices and sensors for electromagnetic interference measurement and EMC standard regulations, and so on.

**전자화전기설비특론 3 credit**

**(Electric Magnetic and Electronic Type Electrical Installation)**

The lecture deals with the medium and high power electronic converters that process power for a variety of applications in smart electrical installation. The lectures cover especially basic concepts of power conversion, basic theories of power conversion systems, protection of power conversion system, and basic concepts of power electronics in smart electrical energy networks.

**컴퓨터및네트워크보안특론 3 credit**

**(Advanced Computer and Network Security)**

In current information based industrial environment, secure cooperation among computers and networks by using stable management against the malicious attack intents is very important. Especially, distribution of malicious codes, illegal information acquisitions, and threats and attacks to network resources must be protected by counterplan of security. Effective and stable technologies for protecting those threats and attacks might be understood and applied in the practical computer networks. This lecture make the students understand the concept and the points of various malicious code, threats and attacks to computer and network. They can also understand effective and stable protecting technologies and learn detail practical methods against to threats and attacks on the computer and networks.

**화재공학특론 3 credit**

**(Advanced Fire Protection Engineering)**

Fire protection engineering identifies risks and design safeguards that aid in preventing, controlling, and mitigating the effects of fires. This lecture provides cause of petroleum fire, building fire, prevention of fire, detecting method, and technologies of extinguishment facilities.