

## The Department of Instrument Science and Engineering (ISE)

### ■ Program Overview

The Department of Instrument Science and Engineering (ISE), formerly the Department of Precision Instruments and Machinery, was founded in 1958, with precision instrument and machinery, measuring and testing technologies and instruments and navigation, guidance and control as its sub-disciplines. The four sub-disciplines are Institute of Automatic Detection, Institute of Precision Engineering and Microsystem, Institute of Intelligent Mechatronics and Institute of Navigation, Guidance and Control. The department highlights cross-discipline, and focuses on advanced sensors, small and special robot, on-line detection, advanced instruments and system, nondestructive detection, opto-electronic and visual detection, bio-information detection and guidance and positioning, which serve to main areas of national economy, i.e. industry, agriculture, national defense, aviation, medicine, transportation and energy.

Apart from the undergraduate courses in Instrument Engineering, ISE offers the MSc courses in Inertial navigation technology and equipment, Precision instruments and machinery, and Measurement technology and equipment. There are also the doctorate and post-doctor research station in ISE.

Instruments lie at the heart of scientific research and engineering applications. ISE was regarded as a focus for the science and technology related to diverse instruments. A wide range of applications are involved from medical engineering, aero-navigation devices to industry automation and automatic measurement systems. The extensive list of research funding ranges from the national and local governments to industry companies. In the last 5 years, the total amount of research funding is 1 billion Yuan with over 200 finished research projects, and 5 academic monographs and more than 500 journals have been published.

There are now 46 academic staff as well as a large number of post-doctors and research students working in the department.

### ■ Research Directions

Precision Instrument and Machinery

Measuring and Testing Technologies and Instruments

Navigation, Guide and Control

### ■ Main Courses

Course name(English)	Semester	Credit Hours	Departments	To whom
The Experimentations of FACTS	fall	2	Electrical Engineering of SEIEE	Master

Applied science of Superconductivity	Spring	2	Electrical Engineering of SEIEE	Master
Applications of Large System Optimization Theory to Power Systems	Spring	2	Electrical Engineering of SEIEE	Master
Modern Power Supply Technology	Spring	2	Electrical Engineering of SEIEE	Master
Computer Vision	Spring	3	Automation of SEIEE	Doctor
Information Fusion	Spring	2	Automation of SEIEE	Doctor
Adaptive Control	fall	2	Automation of SEIEE	Master
Advanced research writing	summer	2	Automation of SEIEE	Master
Presenting scientific ideas – case studies from embodied intelligence	summer	1	Automation of SEIEE	Master
Linear System Theory	fall	3	Automation of SEIEE	Master
Machine Learning - Fundamental and Practice	Spring	3	Computer Science of SEIEE	Master
Image Processing and Machine Vision	fall	3	Computer Science of SEIEE	Doctor
Theory and Methods for Statistical Learning	fall	3	Computer Science of SEIEE	Doctor
Intelligent Speech Technology	Spring	3	Computer Science of SEIEE	Master
Network Computing	Spring	3	Computer Science of SEIEE	Master
Digital Image Processing	fall	3	Computer Science of SEIEE	Master
Advanced Computer Architecture	fall	3	Computer Science of SEIEE	Master

Computer Graphics	Spring	3	Computer Science of SEIEE	Master
Advanced Computer Networks	fall	3	Computer Science of SEIEE	Master
Programming Language	Spring	3	Computer Science of SEIEE	Doctor/Master
Statistical Learning and Inference	fall	3	Computer Science of SEIEE	Master
Bioinformatics	Spring	3	Computer Science of SEIEE	Master
Security Engineering	fall	2	Computer Science of SEIEE	Master
Coding and Information Theory	fall	3	Computer Science of SEIEE	Master
Algorithm analysis and Theory	Spring	3	Computer Science of SEIEE	Master
Applied Algebra	fall	3	Computer Science of SEIEE	Master
Parallel Computing and Algorithms	Spring	2	Computer Science of SEIEE	Master
Computer Animation Design And Data Visualization	fall	3	Computer Science of SEIEE	Master
Modern Mobile Communications and Computing	Spring	3	Computer Science of SEIEE	Doctor
Advanced Topics on Internet of Things	fall	3	Computer Science of SEIEE	Doctor
Introduction to Web Search and Mining	Spring	2	Computer Science of SEIEE	Master
Digital Image Processing	fall	3	Electronic Engineering of SEIEE	Master
Stochastic Processes and Queuing Theory	fall	2	Electronic Engineering of SEIEE	Master

Design and Performance Analysis	Spring	3	Electronic Engineering of SEIIEE	Master
Communication Theory and Systems	fall	3	Electronic Engineering of SEIIEE	Master
Modern Signal Processing	fall	3	Electronic Engineering of SEIIEE	Master
Visual Computing Theory and Engineering	Spring	2	Electronic Engineering of SEIIEE	Master
They and Technology of Information security	fall	2	Electronic Engineering of SEIIEE	Master/Doctor
Array Signal Processing and Space-Time Signal Processing	Spring	3	Electronic Engineering of SEIIEE	Master
Waveguide optics	Spring	3	Electronic Engineering of SEIIEE	Master
Electrumagnetic in Modern Communication	fall	2	Electronic Engineering of SEIIEE	Master
Advanced Theory of Wave Propagation and Antenna	fall	2	Electronic Engineering of SEIIEE	Doctor
Semiconductor Physics and Devices Physics	Spring	3	Electronic Engineering of SEIIEE	Master
Advanced Theory of Electro magnetic Field	fall	3	Electronic Engineering of SEIIEE	Master
Organic Electroluminescent Display and Lighting	Spring	3	Electronic Engineering of SEIIEE	Master
Theory of Microwave and speed circuits	Spring	3	Electronic Engineering of SEIIEE	Master
Low-noise electronic Design & Detection of Signal in Noise	Spring	3	Instrument Science and Engineering of SEIIEE	Master
Chinese	fall/spring	2	International School of Education	Doctor/Master
Chinese Culture	fall/spring	2	International School of Education	Doctor/Master

Matrix Theory	fall	3	Mathematics	Master
Algorithmic method	fall	3	Mathematics	Master