Introduction to Optical Information Science and Engineering

1. The College of Optical Science and Engineering

The College of Optical Science and Engineering (COSE) at Zhejiang University is the successor of the Division of Optical Instrumentation, which was founded in 1952 as the first education & research base of optical engineering for college students in China. The first Dean was Prof. Zenglu He, who was the head of the Department of Physics. In 1960, the Department of Optical Instrumentation was established. The programs for graduates and PhDs were then built up in 1978 and 1984, respectively. In 1985, the post-doctoral workshop for optical engineering was also set up successfully. In 1988, Optical Instrumentation at ZJU was proved as one of the first batch of national key discipline. The department of optical instrumentation was renamed as Department of Optical Engineering in 1998. Later, the department had grown into the College of Optical Science and Engineering (COSE) with great successes in 2015.

Currently the college has seven research institutes, three state key laboratories, three provincial key laboratories as well as four international joint laboratories. The college also has an outstanding training system for young people, including one postdoctoral workshop, three PhD programs, two graduate programs and one undergraduate program. Under these programs, there are about 120 undergraduate students, 110 graduate students and 50 PhD students admitted to the college annually. In the college, there are 60 full professors and 33 associate professors. All of them have strong academic and professional backgrounds and contribute to the development of the teaching areas.

With the great successes in the past years, the college has a reputation for being a world-class institute with outstanding research & teaching for optics & photonics. It has become well-known as "the cradle of talents for optical engineering in China". In the past years the Minister of Education (MOE) of China organized two official evaluations for all the departments of optical engineering in China, and ZJU-COSE had been ranked No. 1 in China. In 1960s, the department had developed ultra-fast camera, which was awarded with the outstanding collectivity award at the first National Science and Technology Congress held in 1978. In 2008, the college won a national outstanding award of Science and Technology regarding to the significant contributions.

2. Educational Objectives

The objective of the program is to educate students who excel in engineering and applied science, but also have a working knowledge of other disciplines. It is expected that a student receiving a degree would have the background for suitable employment in industry or an engineering field, including information technology, optoelectronics, optical engineering, optical communications and image processing. To achieve these goals, the programs and courses are designed to be flexible, and cater to students at multiple levels. Students can either specialize in the area of

Optoelectronics System and Engineering or Optical Communication and Integrated Opt-electronics Technology.

3. Outcomes

Students who complete the course should be able to demonstrate the abilities of doing the following:

- Be Able to use mathematics, natural sciences, engineering foundations and professional knowledge to solve complex engineering problems
- Be able to apply the basic principles of mathematics, natural sciences and engineering sciences to identify, express, and analyze complex engineering problems through literature research to obtain effective conclusions.
- Be able to design/development solutions: be able to design solutions to complex engineering problems in the field of optoelectronic information science and engineering, design optoelectronic/optical information systems that meet specific needs, and be able to reflect the sense of innovation in the design, considering humanities, society, health, and safety.
- Be able to study complex engineering problems in the field of optoelectronic information science and engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis.
- Be able to use modern tools: able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex engineering problems in the field of optoelectronic information science and engineering, including the prediction and simulation of complex engineering problems, and be able to understand Limitations of tools, etc.
- Be able to use relevant knowledge to conduct reasonable analysis, evaluate the impact of professional engineering practices and complex engineering problem solutions on society, health, safety, law, and culture, and understand the responsibilities that should be undertaken.
- Be able to understand and evaluate the impact of engineering practice of complex engineering issues on the environment and sustainable development of society.
- Possess humanities and social science literacy, strong sense of social responsibility, able to understand and abide by engineering professional ethics and norms in engineering practice, and perform responsibilities.
- Be able to assume the roles of individuals, team members and leaders in a team with a multidisciplinary background.
- Be able to effectively communicate and communicate with leaders, partners and the public on complex engineering issues, including writing reports and design manuscripts, speeches, and expressing views clearly; and having a certain international perspective, able to communicate and communicate in a cross-cultural context.

- Understand and master engineering management principles and economic decision-making methods, and be able to apply them in a multidisciplinary environment.
- Have the consciousness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to development.

4. Curriculums

Intro to Electronics, Intro to Computing, Photonic Devices, Fields and Waves, Analog Signal Processing, Probability with Engineering Application, Semiconductor Electronics, Electronic Circuits, Digital Systems Lab, Computer Systems Engineering, Applied Optics, Optoelectronics, Physical Optics, Applied Optoelectronics Lab, Final Project, etc.

5. Prospects of the Program

In the past three years, the proportion of undergraduate graduates for further study is about 75%, of which the rate of overseas study is about 40%, and about 80% of the students who go abroad for further studies have entered the top 100 universities in the world. The employment direction of graduates is mainly concentrated in scientific research institutes and universities, Huawei, ZTE, Hikvision and other famous enterprises.

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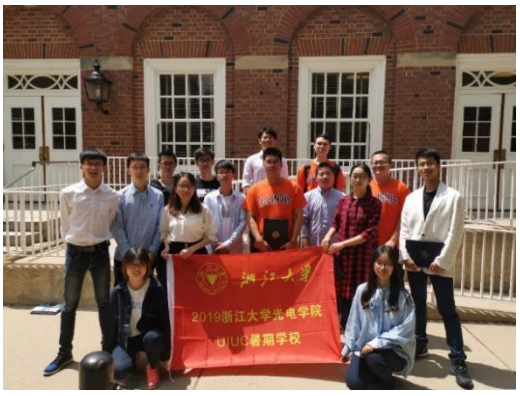
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