

College of Science

NAME OF THE PROGRAM

Optical Engineering (New Energy Materials & Devices)

光学工程（新能源材料与器件）

RESEARCH DIRECTIONS:

- Preparation of optoelectronic materials and devices
- Calculation and simulation of optoelectronic materials and devices
- Physics and process control of new energy and plasma

TYPE OF THE DEGREE: Academic Degree

DEGREE CONFERRED: Master of Engineering (M.E)

SCHOOLING: 3-4 years

1. BRIEF INTRODUCTION
2. PROGRAM OBJECTIVES
3. CURRICULUM
4. SUPERVISOR INFORMATION

1、 BRIEF INTRODUCTION

College of Science of Donghua University, was established in 1999, developed from Department of Basic Teachings, Textile University of China. In 1977/1979, we began to recruit undergraduate students, majoring in mathematics/physics. In 1981, it became one of the first units in the country to receive the right to grant master's degrees. By April 2023, we have 101 full-time faculty members, including 27 professors and 46 associate professors. The proportion of the faculty member with doctoral degree is over 81%. The proportion of the faculty member with more than one year of overseas academic experience is over 55%.

The English-taught Master of Engineering (M.Eng.) program extensively enrolls and cultivates graduate students worldwide under the discipline New Energy Material & Device, which is a multidisciplinary strategic emerging discipline crossed by optical engineering, physics, materials, and electronics.

New energy will be needed to meet skyrocketing energy demand in the worldwide range. Donghua researchers are trying to lead efforts to support a scalable, innovative, clean energy and reliable energy sources. These technologies include, but are not limited to: Energy storage device, Solar photoconversion, Plasma topic related with nuclear fusion energy.

A solid, theoretical understanding of new energy materials and devices will be trained with plenty of attention for the wide range of its applications.

2、 PROGRAM OBJECTIVES

The program has endeavored in cultivating high-level international talents with comprehensive capability. Through the cultivation, to enable students to master the basic theory involved in new energy materials and devices, understand the forefront of the discipline, be familiar with the preparations, measurements and analysis of new energy material & device, has the ability of independent scientific research and special technical work, so that students have abilities of innovation, organization and coordination.

Our approach is pragmatic as well as theoretical and experimental. As an academic, we not only expect you to understand and make use of the appropriate tools, but also to program and develop your own.

There are opportunities to do an internship for your Master's project in companies related with energy storage and solar photoconversion companies in Shanghai. We also have very good scientific platform with the unit member (Donghua University) of Magnetic Confinement Fusion Research Center, Ministry of Education, China, and other joint laboratories and enterprises in China.

To be eligible for our Master program, you are required to graduate from Physics, chemistry, materials science and engineering, environmental science and engineering, information science and engineering, electronic science and technology, computer science and technology, mechanics, and other related fields of science and engineering.

3、 CURRICULUM

In line with the Chinese university system, the program of Masters Degrees in Donghua university last for two and a half years and the school starts from fall semester.

1. The 1st & 2nd semesters: courses study
2. The 3rd semester: thesis proposal submission and report
3. April of the 6th semester: concealed evaluation on the thesis
4. May of the 6th semester: oral defense on thesis

Main Courses

1. 数值分析 (Numerical analysis) (Credit 2)
2. 光电成像技术与系统 (Photo-electronic Imaging Technology and System) (Credit 3)
3. 微纳光子学及应用 (Fundamental and Application of Micro-Nano-photonics) (Credit 3)
4. 薄膜沉积技术 (Thin Film Deposition) (Credit 3)
5. 半导体材料与器件 (Semiconductor Materials and Devices) (Credit 3)
6. 光学系统设计 (Optical system design) (Credit 3)
7. 光电子学 (Optoelectronics) (Credit 2)
8. 激光光学 (Laser Physics) (Credit 2)
9. 高等光学 (Advanced optics) (Credit 3)
10. 光纤传感技术 (Optical Fiber Sensing) (Credit 3)

Requirements for Thesis Work and Publication of Academic Results

It usually takes one year or more to complete a thesis. Before conducting research on the thesis, the first step is to start the thesis proposal. The thesis proposal should be submitted in the third semester, usually before the end of November, and give an oral presentation. The thesis proposal should include the research background of the topic, the problems to be solved, the research plan, and the expected research progress, and be accompanied by a comprehensive review on the topic. The research work on the thesis topic could only begin after the approve of thesis proposal by a committee of at least 3 experts. Usually a concealed evaluation on the thesis is imposed to all the students or randomly selected students before the final oral defense of their thesis. Necessary revision must be completed for the thesis draft. The final oral defense usually take place in May in the 6th semester.

For other requirements, please refer to the "Basic Requirements for Obtaining Achievements for Graduate Students in the College of Science".

4、SUPERVISOR INFORMATION



Prof. Dr. Zhang Jing (Ph D's supervisor)

Research Area:

- 1) Functional Thin Solid Film;
- 2) Low-temperature Plasma Physics and Applications;
- 3) Material Structure and Properties.

E-mail: jingzh@dhu.edu.cn



Prof. Dr. Zhong Fangchuan (Ph D's supervisor)

Research Area:

- 1) fusion plasma
- 2) application of low temperature plasma

E-mail: fczhong@dhu.edu.cn



Prof. Dr. Wang Chunrui (Ph D's supervisor)

Research Area:

- 1) Synthesis and optoelectronic properties of 1D and 2D materials;
- 2) 1D, 2D-materials based lithium ion battery;
- 3) 1D-2D hybrid material based optoelectronic and wearable devices.

E-mail: crwang@dhu.edu.cn



Prof. Dr. Liang Yongcheng (Ph D's supervisor)

Research Area:

Calculation and simulation of functional materials

E-mail: ycliang@dhu.edu.cn



Prof. Dr. Wu Binhe (Ph D's supervisor)

Research Area:

- 1) theoretical investigation of quantum transport in nanostructures;
- 2) numerical simulation of thermoplasmonics, photonics and optoelectronics devices

E-mail: bhwu@dhu.edu.cn



Prof. Dr. Wang Jiale (Ph D's supervisor)

Research Area:

Preparation of optoelectronic materials and devices

E-mail: jjiale.wang@dhu.edu.cn



Prof. Dr. Du Chengran (Ph D's supervisor)

Research Area:

- 1) Complex (dusty) plasma physics;
- 2) Plasma discharge and diagnostics;
- 3) Atmospheric plasma and applications;
- 4) Dust in fusion devices;

E-mail: chengran.du@dhu.edu.cn



Associate Prof. Dr. Ding Ke (Master's supervisor)

Research Area:

Numerical simulation and experiment research of low temperature plasma applied technology

E-mail: dingke@dhu.edu.cn



Associate Prof. Tang Xiaoliang (Master's supervisor)

Research Area:

- 1) Low-temperature Plasma physics;
- 2) Plasma polymerization;
- 3) Smart materials and Intelligent polymer

E-mail: xltang@dhu.edu.cn



Associate Prof. Dr. Lu Hongwei (Master's supervisor)

Research Area:

- 1) Tokamak Plasmas;
- 2) Runaway electrons in tokamak;
- 3) Nuclear Physics;
- 4) Diagnostics system in tokamak

E-mail: hwlu@dhu.edu.cn



Associate Prof. Dr. Li Li (Master's supervisor)

Research Area:

- 1) Plasma response to 3D external magnetic perturbation fields;
- 2) Physics and control of the resistive wall mode and edge localized mode;
- 3) Plasma flow damping by 3D fields;
- 4) 3D structure effects on macroscopic instabilities in fusion plasmas

E-mail: lili8068@dhu.edu.cn



Dr. Wu Jingyuan (Master's supervisor)

Research Area:

Two-dimensional materials and optoelectronic devices

E-mail: jywu@dhu.edu.cn