Mechatronic Engineering (Master's and Doctoral program)

College of Mechanical Engineering, Zhejiang University

http://me.zju.edu.cn

Introduction

The postgraduate program of Mechatronic Engineering is offered by the Institute of Mechatronic Control Engineering, College of Mechanical Engineering at Zhejiang University (ZJU). The discipline of Mechatronic Engineering in ZJU is a state key discipline and hosts a high-level research platform named the State Key Laboratory of Fluid Power and Mechatronic Systems. The research work of the laboratory is concentrated on Fluid Power Transmission and Control, Applied Fluid Mechanics, Control and Signal Processing of Mechatronic Systems, Integration and Intelligentization of Mechatronic Systems, Design and Manufacturing of Mechatronic Systems and Equipment, etc

Research Fields

1. Fluid Power Transmission and Control

Basic theory and application research on Energy saving, noise reduction, sealing, lubricated wear of hydraulic components; Electro-hydraulic control components, Electro-hydraulic energy-conservation control, Water hydraulic control, Electro-hydraulic vibration control, Multi-DOF Electro-hydraulic control; Pneumatic noise, Pneumatic pipe properties, Pneumatic high-speed buffer; Electro-pneumatic proportion/servo control, Pneumatic servo robot and pneumatic platform, Air compressor and decompressor, Novel pneumatic components, and systems.

2. Applied Fluid Mechanics

Basic theory and application research on Hydrodynamics, Non-Newtonian Fluid Mechanics, Multiphase flow theory, Cavitation Theory& Dynamics, Biofluid mechanics, Microfluid mechanics, Flow visualization, Fluid vibration and flow noise control, Micro-fluidics devices and systems, Fluid transportation and measurement technique, Fluid machinery and Automobile heat flow mechanics.

3. Control and Signal Processing of Mechatronic Systems

Basic theory and application research on Dynamics of mechatronic systems, nonlinear control and intelligent control of mechatronic systems, Vibration control of mechatronic systems; Condition monitoring and fault diagnosis of mechatronic systems; Sensor and measuring system, Testing Technology and signal processing, Detection and quality control.

4. Integration and Intelligentization of Mechatronic Systems

Basic theory and application research on construction machinery and equipment, Materials molding equipment, Ship deck and marine engineering equipment, Aerospace equipment, Power and Energy Engineering equipment, Test equipment, automobile electronic and mechatronic

systems, Robot, MEMS (micro electro mechanical system), Biological manufacturing engineering and other traditional major technical equipment as well as integration of mechanical, electrical and hydraulic in special environment and new areas.

5. Design and Manufacturing of Mechatronic Systems and Equipment

Basic theory and application research on Design theory and methodology of mechatronic systems and equipment, Virtual reality and computer simulation, Rapid product design, Reverse Engineering Technology, Reliability design; Mechatronic systems and equipment Manufacturing process and equipment, Advanced manufacturing technology and equipment, Digital manufacturing and numerical control systems, Digital assembly technique; Precision engineering, Micro-system theory and Micro-manufacturing technology.

Core Courses：

The basic of Electro-hydraulic Proportion technology, Modern Control Theory, Mechatronics Control, MEMS Design and Manufacture, Measurement and Modern Instrumentation, Finite Element Methods and its Engineering Application, Advanced Mechatronics Control, and etc