上海交通大學 SHANGHAI JIAO TONG UNIVERSITY | 机械与动力工程学院 School of Mechanical Engineering

School of Mechanical Engineering

Shanghai Jiao Tong University

Contents

Message from the Dean

The School of Mechanical Engineering (ME) at Shanghai Jiao Tong University (SJTU) has a history of over 100 years and is the top ranked mechanical engineering program in the country. In the past century, the School has cultivated a great number of industry and society pillars and made significant contributions to the country's prosperity and the scientific and technological progress.

Today the School has over 330 faculty members, dedicated to the innovative and prospective research in mechanical engineering. Many of them are well recognized and have earned international/national level awards from the government or professional societies. Currently the School has 2 members of the National Academy of Sciences and 4 members of the National Academy of Engineering.

The School's research activities cover various fundamental thematic areas in mechanical engineering, and the School is also developing new emerging fields related to mechanical engineering. The annual research funding of the School has been increasing to over $112 million, witnessing its rapid growth and making the School one of the most highly funded ME programs nationwide.

Over 5000 students are studying at the School. The School offers our students a vibrant educational atmosphere and allows them to gain unique study experiences. Besides the educational traditions to nurture students with solid foundation, broad knowledge and excellent practical ability, the students are also encouraged to actively participate in team and entrepreneurial activities to broaden their experience. Students here also have opportunities to study overseas at the partner universities with the School in North America, Europe and Asia.

The School has a clear and strong vision for the future. The School will pursue the goal of becoming a world-class engineering school, make significant contribution to build an innovative-oriented society and cultivate top talents of high quality and with global vision. The School will, as always, offer the best learning experience to the students, the most rewarding working environment to the employees and the most effective service to the industry and society.

We welcome your interest in our school and hope you will join us!

Du Zhaohui

Professor and Dean
School of Mechanical Engineering
Shanghai Jiao Tong University

Facts and Figures

1913

Founded in 1913, the School of Mechanical Engineering (ME) at the Shanghai Jiao Tong University (SJTU) has been always playing a leading role in the field of Mechanical Engineering in the country over the past century.

6 Academicians & 134 Professors

- 134 Professor
- 155 Associate Professor
- 46 Assistant Professor

Top Rankings

SJTU-ME is always rated among the best in the country in many rankings. Its Mechanical Engineering discipline is at the first place in the discipline ranking by Ministry of Education of China. The SJTU's Engineering subject ranks the top one ten-thousandth in the global institutions according to the Essential Science Indicators ranking in 2016, and the Mechanical and Power Engineering subjects of the School make key contributions to this breakthrough.

8 Degree Programs

Undergraduate degree programs	Graduate degree programs
Mechanical Engineering	Mechanical Engineering
Energy and Power Engineering	Power Engineering and Engineering Thermophysics
Industrial Engineering	Nuclear Science and Engineering
Nuclear Engineering and Nuclear Technology	
New Energy Science and Engineering	

4 Departments & 18 Research Institutes

ME consists of 4 departments and 18 research institutes. The 4 departments are Department of Mechanical Engineering and Automation, Department of Power and Energy Engineering, Department of Industrial Engineering and Management and Department of Nuclear Science and Engineering.

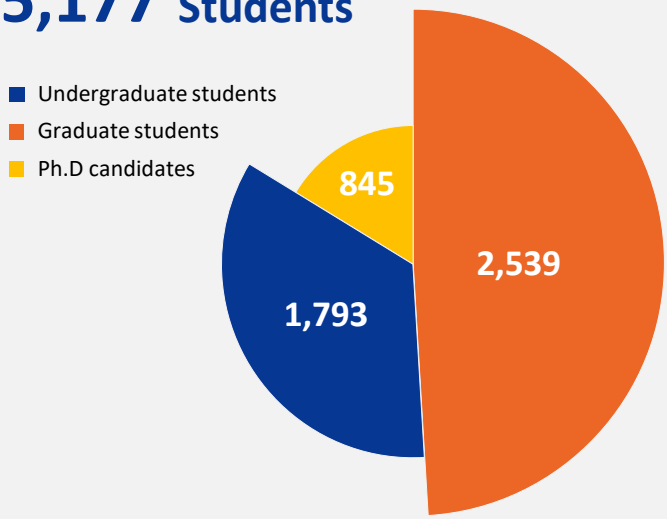
332 NSFC Grants

From 2013 to 2017, 332 grants from National Natural Science Foundation of China (NSFC) were obtained by ME.

¥ 725 Million

In 2017, over 725 million RMB（$ 112 Million）research funding from government, business and industry was granted to ME.

5,177 Students



46 International Programs

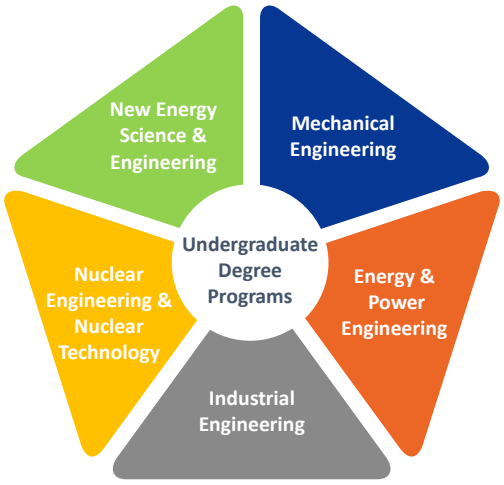
ME has an excellent international network. This is reflected in the 46 international programs supporting student exchanges and collaborations with top universities worldwide.

50 Thousand Alumni

Since 1913, over 50 thousand alumni have graduated from the SJTU-ME. As scientists, engineers, educators, statesmen and entrepreneurs, they have made great contributions to the innovation of science and technology and the development of the society.

Students

Undergraduate Students

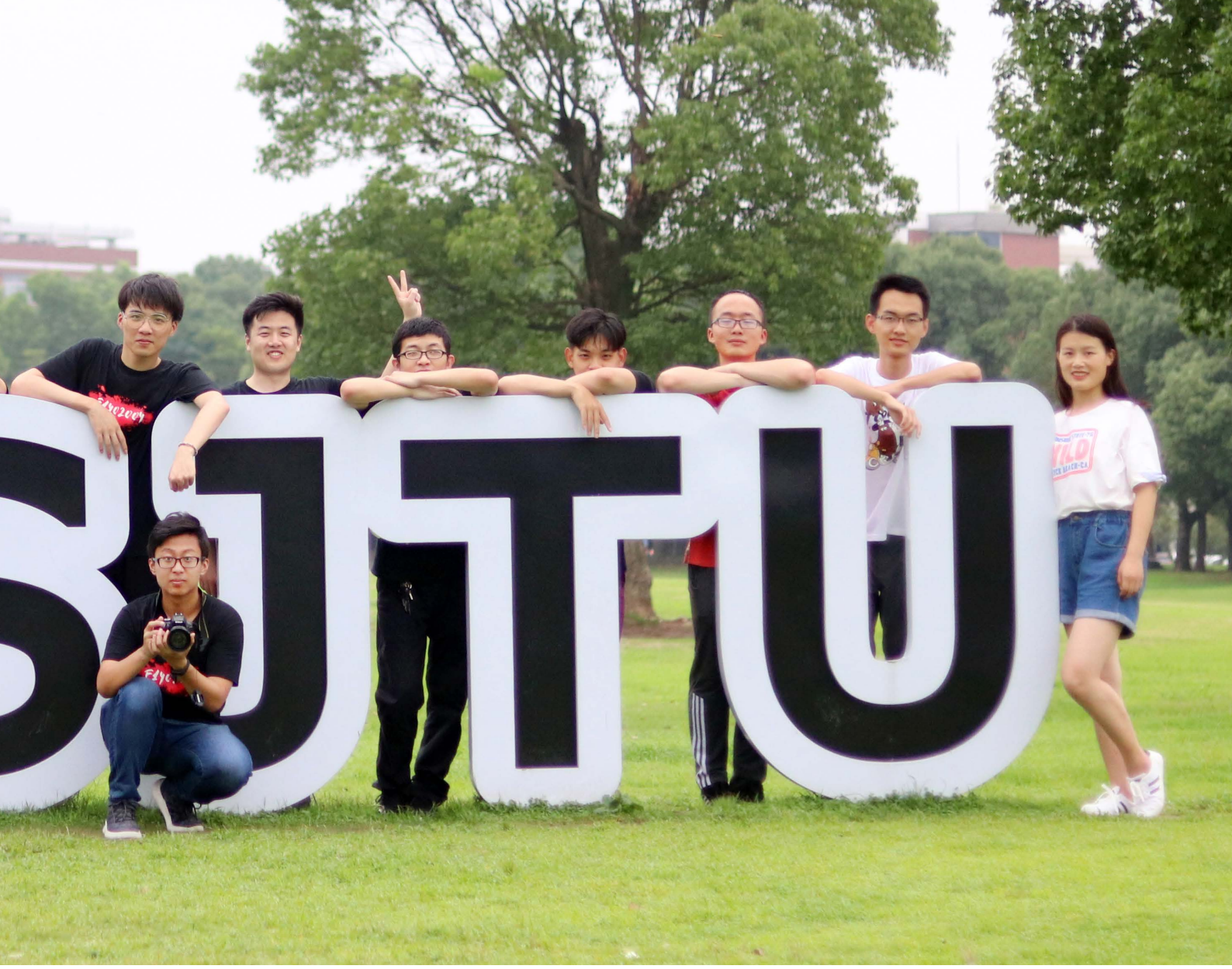


Mechanical Engineering

The Mechanical Engineering program at SJTU aims to cultivate innovative discipline-integrated talents. The Mechanical Engineering curriculum covers traditionally preponderant disciplines as advanced manufacturing, robotics, automotive engineering, vibration and acoustic control, and the emerging disciplines as smart manufacturing, bio-mechatronics and autonomous vehicle. The Mechanical Engineering program excels in the educational efforts allowing students to gain unique design and practice experiences.

Core courses:

◎ Design & Manufacturing
◎ Modeling, Analysis and System Control
◎ Manufacturing Process I
◎ Measurement Principles and Technologies
◎ Mechanical Dynamics and Vibration



Energy and Power Engineering

The target of the Energy and Power Engineering program at SJTU is to cultivate top talents in energy conversion & utilization and power engineering fields for scientific research, technology development and engineering application. The curriculum design is on basis of the national strategic needs and international academic frontiers, covering advanced disciplines as flow and heat transfer in micro/nano systems, advanced combustion engines, gas turbines, energy utilization in refrigeration systems, and those emerging or crossed disciplines as solar energy, fuel cell technology, energy internet, smart energy and clean energy utilization.

Core courses:

◎ Heat Transfer

◎ Fluid Mechanics

◎ Combustion Theory

◎ System Dynamics and Mechanical Vibrations

Industrial Engineering

The Industrial Engineering program at SJTU aims to cultivate interdisciplinary talents with engineering and management background. The program curriculum includes operation management of production and service, quality and reliability engineering, logistics and supply chain. The students in this program can also learn about the advanced technologies and applications of smart manufacturing and big data in the fields of semiconductor, automotive, aeronautics and astronautics, healthcare and so on. The graduates from this program can work in the advanced manufacturing fields as aeronautics and astronautics, automotive and electronics industries, and the service fields as logistics, finance and consulting industries.

Core courses:

◎ Operations Research
◎ Engineering Statistics
◎ System Modeling and Simulation
◎ Production Planning and Control
◎ Quality Management

Nuclear Engineering and Nuclear Technology

The Nuclear Engineering and Nuclear Technology (NENT) Program is a comprehensive program covering the scope of nuclear reactor engineering, nuclear fuel cycle and materials, radiation protection and nuclear technology. This program aims to cultivate students with specialized knowledge and solid foundation in nuclear engineering to satisfy the national needs of economics and society development. Students in this program need to master knowledge in physics, chemistry, energy, machinery, materials, control and management.

Core courses:

◎ Nuclear Thermal-hydraulics
◎ Reactor Physics
◎ Reactor System and Equipment
◎ Reactor Safety Analysis
◎ Radiation Protection
◎ Nuclear Fuel and Materials

New Energy Science and Engineering

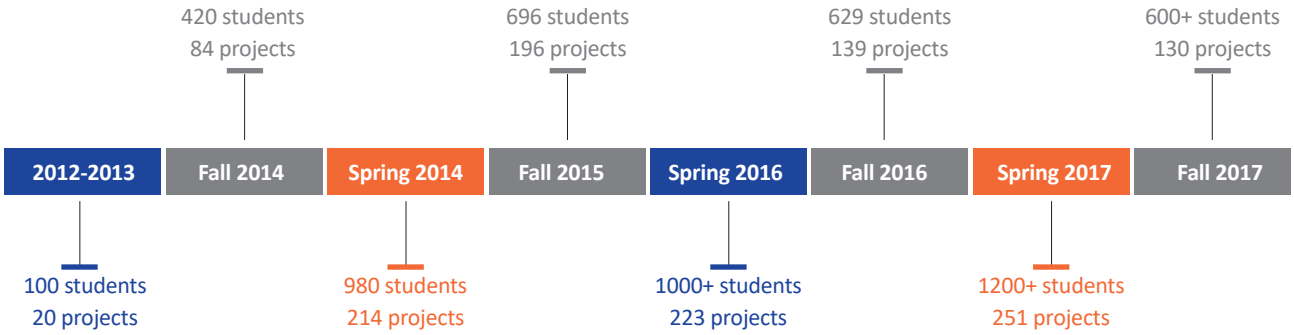
The New Energy Science and Engineering program is an interdisciplinary undergraduate education platform. The goal of this program is to cultivate leading, innovative and international-vision talents in the new energy industries as solar photovoltaic, solar thermal utilization and heat pump, wind energy, biomass energy, electricity storage and smart grid areas. The curriculum includes courses related to electrochemistry, renewable energy, power information and power management in addition to the fundamental courses in mechanical and power engineering.

Core courses:

◎ Power Electronics
◎ Solar Photovoltaic Science and Application
◎ Biomass Energy
◎ Solar Thermal Application
◎ Wind Energy Technologies

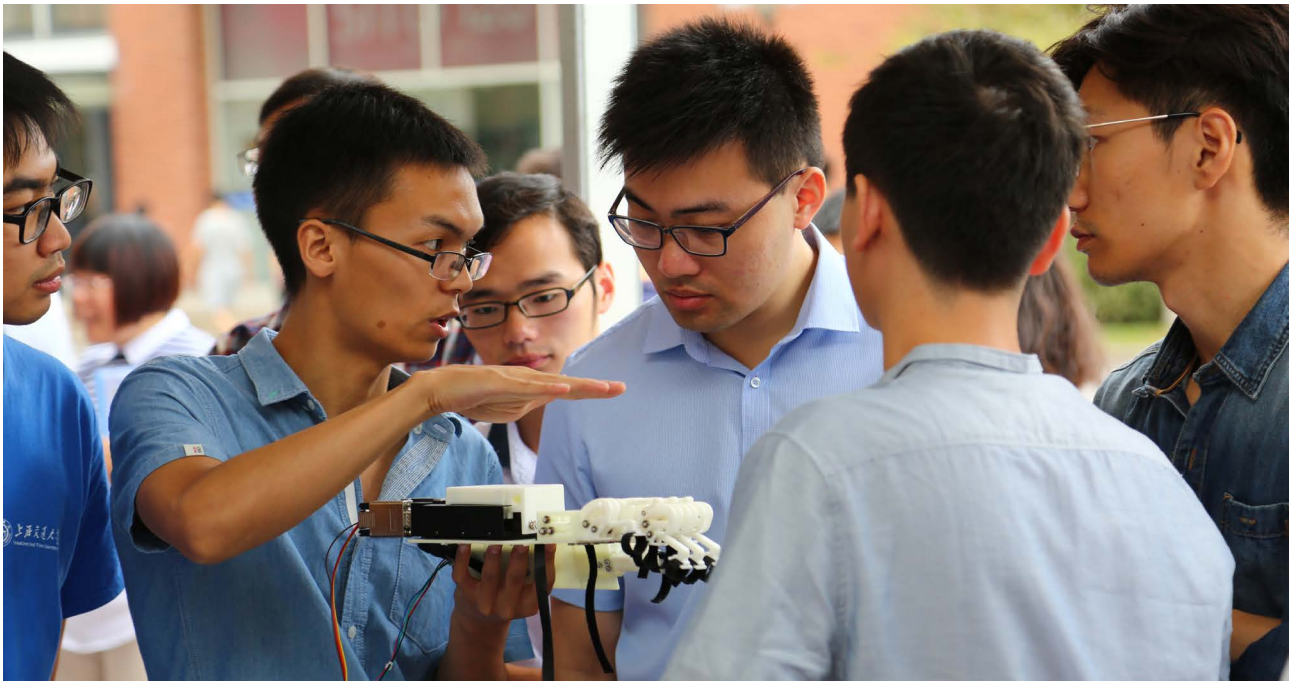
Engineering Design Showcase

The Engineering Design Showcase at SJTU-ME highlights our undergraduate students' engineering design projects and represents their highest-level achievements. The showcase displays engineering design projects from different courses in the Mechanical Engineering Program and the Energy and Power Engineering Program such as Design & Manufacturing I and II and Engineering Thermodynamics.



Engineering Design Showcase (Fall 2017)

Graduate Students



SJTU-ME Graduate Programs including the M.S. program and Ph.D. program are dedicated to training elite, talented individuals with solid foundation, broad knowledge, good practical ability and global vision. The core value of education is to equip graduate students with appreciation for scientific exploration, innovative spirit and critical thinking. A complete system has been established to cultivate more highly-competent graduate students by combining the training process and the target management, improving the talent selection process, and a series of graduate training quality assurance measures. Students need to select courses and write a thesis in one or more of the following programs.

Mechanical Engineering

◎ Mechanical Manufacturing and Automation
◎ Mechatronics
◎ Machine Design and Theory
◎ Vehicle Engineering
◎ Industrial Engineering

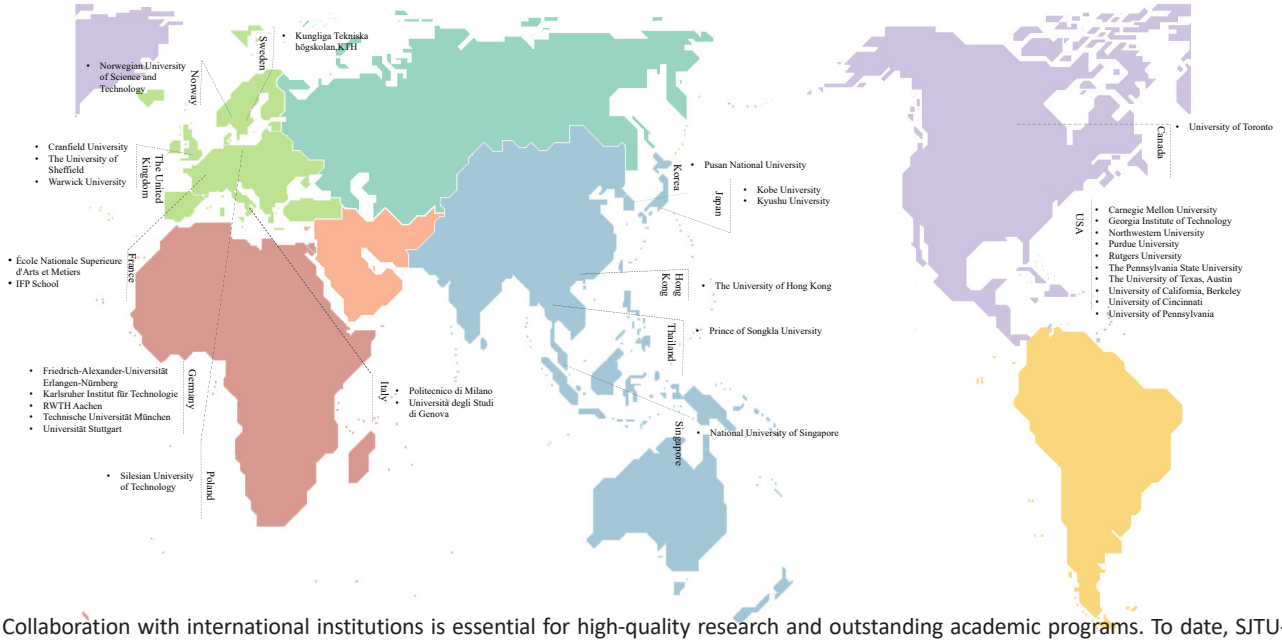
Power Engineering and Engineering Thermophysics

◎ Engineering Thermophysics
◎ Thermal Energy Engineering
◎ Power Machinery and Engineering (Turbomachinery/Internal Combustion Engines)
◎ Fluid Machinery and Engineering
◎ Refrigeration and Cryogenic Engineering
◎ Fuel Cell

Nuclear Science and Engineering

◎ Nuclear Science and Engineering
◎ Nuclear Materials and Fuel Cycle

International Student Exchange Programs



Collaboration with international institutions is essential for high-quality research and outstanding academic programs. To date, SJTU-ME has established partnerships with over thirty world-renowned universities. The School also created a new collaborative education model with the Pennsylvania State University - the Global Capstone Project. Based on this education model, students of the School could improve their engineering design experience, cross-cultural communication ability and broaden their international vision. The School has two innovative talent recruitment bases supported by the Ministry of Education and State Administration of Foreign Experts Affairs, the themes of which are automotive digital design & manufacturing and thermal systems & energy utilization, respectively.

North America

Carnegie Mellon University, USA	3+1+1 Program
Georgia Institute of Technology, USA	Summer Program
Northwestern University, USA	Student Exchange Program Dual Master Degree Program
Purdue University, USA	3+1+1 Program 2+2 Program GEARE Program Student Exchange Program
Rutgers University, USA	2+2 Program
The Pennsylvania State University, USA	Global Capstone Project Undergraduate Exchange Program
The University of Texas, Austin, USA	Student Exchange Program
University of California, Berkeley, USA	Undergraduate Exchange Program
University of Cincinnati, USA	Co-op 2+3 Program
University of Pennsylvania, USA	3+1+1 Program 3+2 Program China Immersion
University of Toronto, Canada	Global Capstone Project

Asia

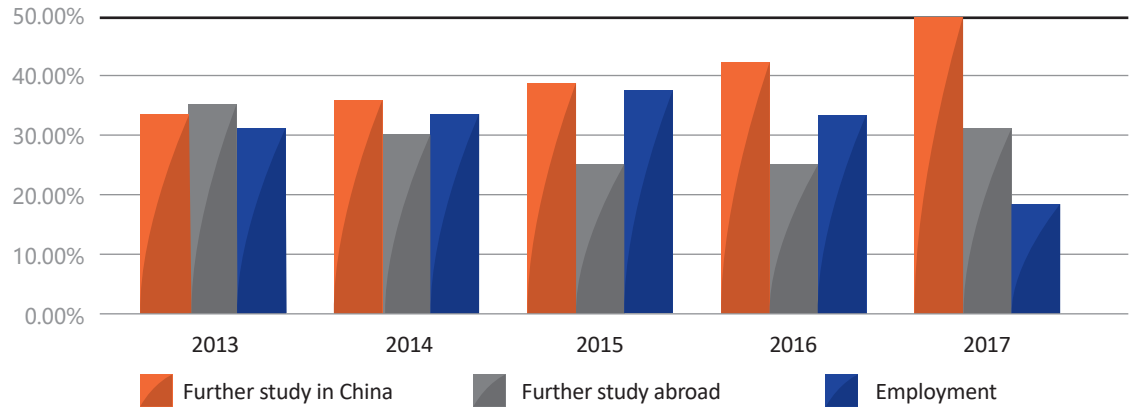
Kobe University, Japan	Summer School Program
Kyushu University, Japan	Dual Master Degree Program Ph.D Exchange Program
National University of Singapore	Joint Ph.D Program
Prince of Songkla University, Thailand	Dual Master Degree Program
Pusan National University, Korea	Dual Master Degree Program Ph.D Exchange Program
The University of Hong Kong, China	2+2 Program

Europe

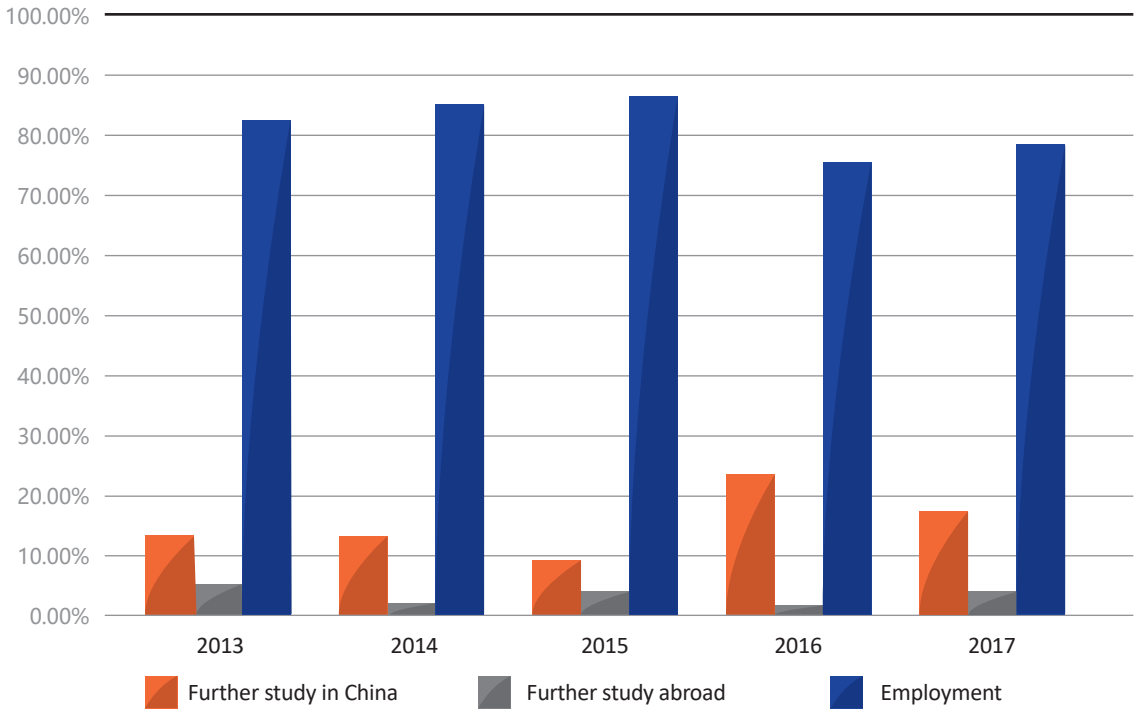
Cranfield University, UK	Dual Master Degree Program
École Nationale Superieure d'Arts et Metiers, France	Dual Master Degree Program
Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany	Student Exchange Program
IFP School, France	Graduate Degree Program Dual Master Degree Program
Karlsruher Institut für Technologie, Germany	GEARE Program
Kungliga Tekniska högskolan,KTH, Sweden	Global Capstone Project
Norwegian University of Science and Technology, Norway	Dual Master Degree Program Student Exchange Program
Politecnico di Milano, Italy	Semester Exchange Program Dual Master Degree Program Joint Master and Ph.D Program Dual Ph.D Program
RWTH Aachen, Germany	Student Exchange Program
Silesian University of Technology, Poland	Research Cooperation
Technische Universität München, Germany	Student Exchange Program
The University of Sheffield, UK	2+2 Program
Universität Stuttgart, Germany	Student Exchange Program
Università degli Studi di Genova, Italy	Dual Master Degree Program
Warwick University, UK	4+1 Program

Students Placement

Undergraduate student placement of 2013-2017

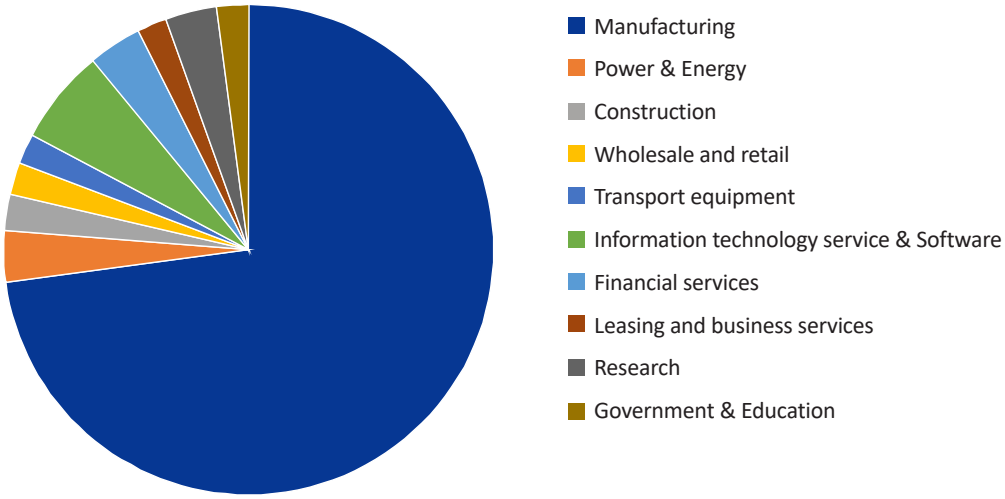


Graduate student placement of 2013-2017

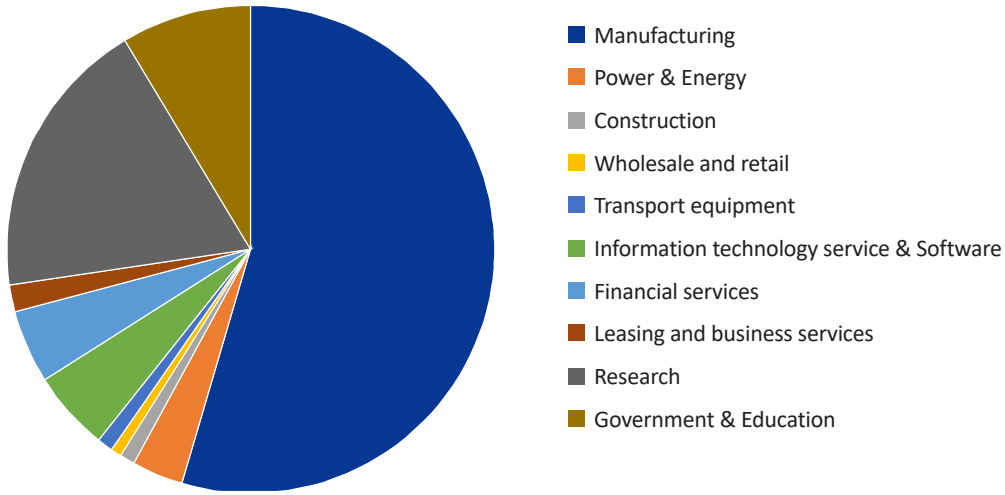


Job placement results for the classes of 2013-2017

Undergraduate student placement of 2013-2017



Graduate student placement of 2013-2017



Faculty

Currently the School is home to 335 faculty members, and most of them have graduated from or worked at world-class universities. Many of them are well recognized and have earned international/national level awards from the government or professional societies.

ME is pleased to invite applications for tenure-track positions anticipated in mechanical engineering at the Assistant or Associate Professor levels. Applicants are welcome to send a curriculum vitae to the Human Resources Office of ME (mejob@sjtu.edu.cn).

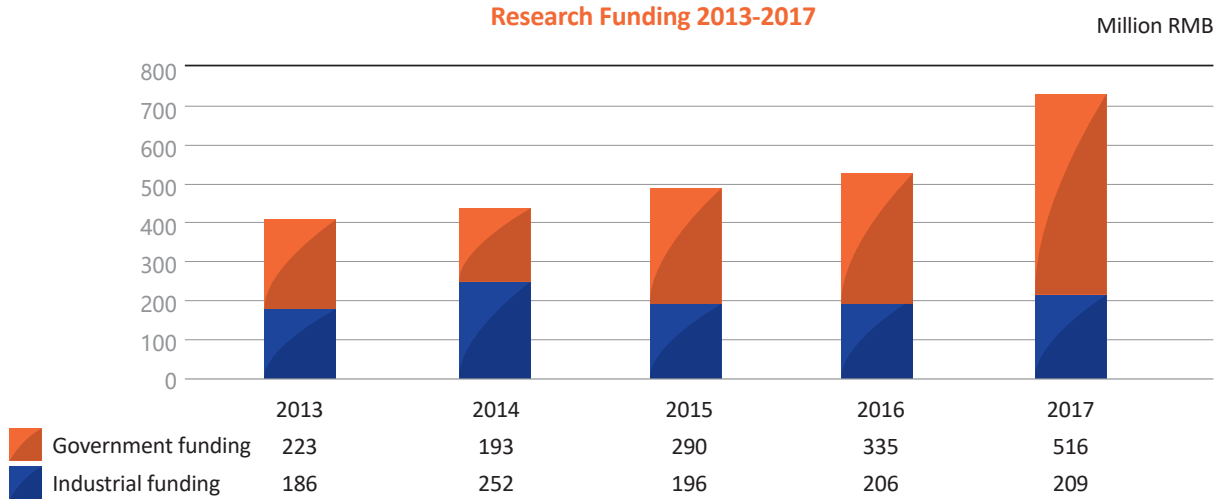
Member of the Chinese Academy of Sciences	2
Chief Scientist for National 973 Program	6
Cheung Kong Scholar Program for Distinguished/Chair Professors	18
NSFC Outstanding Young Scholars	9
Cheung Kong Scholar Program for Young Outstanding Scientists	2
NSFC Innovative Research Group	2
Member of the Chinese Academy of Engineering	4
Thousand Talents Plan	8
NSFC Distinguished Young Scholars	16
Young Top-Notch Talent	1
Thousand Talents Plan for Young Outstanding Scientists	4
Innovative Team Plan, Ministry of Education	2

Research

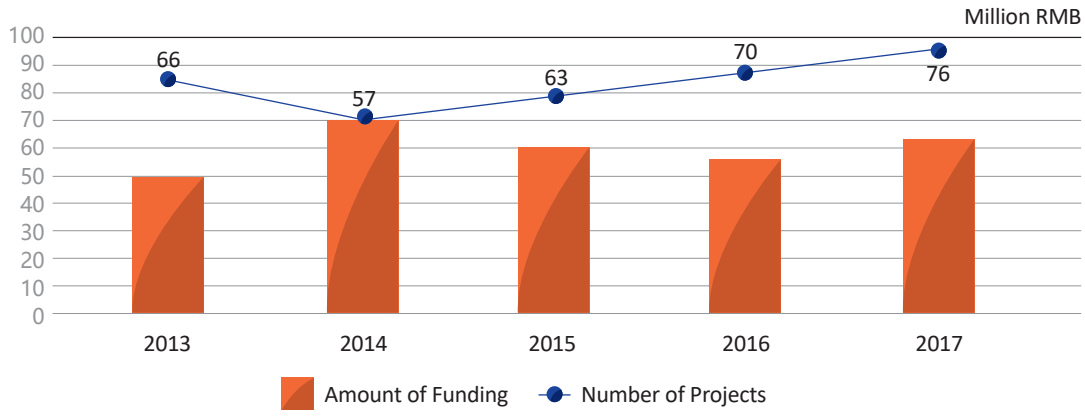
Disciplines

- Mechanical Engineering
- Power Engineering & Engineering Thermophysics
- Nuclear Science & Technology
- Industrial Engineering

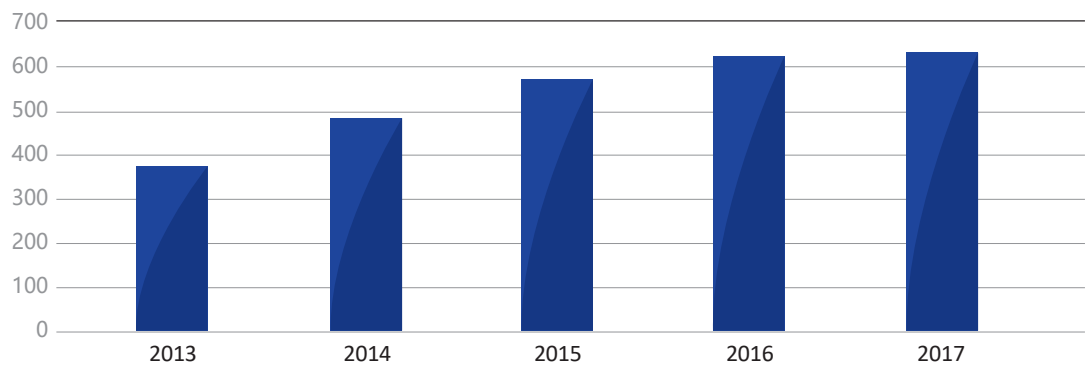
Research Outputs



Grants from National Nature Science Foundation of China (NSFC) 2013-2017



SCI Publications 2013-2017



Institutes

1. Institute of Manufacturing Technology and Equipment Automation

◎ Cutting & Grinding Process and Tools
◎ Intelligent & Special Manufacturing Technologies and Equipment
◎ Non-traditional Processing Technology and Equipment
◎ Machine Tool Error Measurement, Analysis and Compensation
◎ Micro-nano Manufacturing & Coating Technology

2. Institute of Intelligent Manufacturing and Information Engineering

◎ Intelligent Manufacturing System
◎ Precise Measurement and Online Measurement
◎ VR and AR
◎ Simulation and Parallel Computing for Complex Systems
◎ Big Data Management and Analysis
◎ Assembly Line Planning and Information Management
◎ Metal Additive Manufacturing System

3. Institute of Vibration, Shock & Noise

◎ Vibration Analysis and Control
◎ Shock Analysis and Protection
◎ Acoustical Noise
◎ Inverse Problems in Vibration and Acoustics
◎ Machinery Health Monitoring and Fault Diagnosis
◎ Micro/Nano Electromechanical Systems Dynamics
◎ Smart Materials, Structures and Systems

4. Institute of Design and Control Engineering for Heavy Equipment

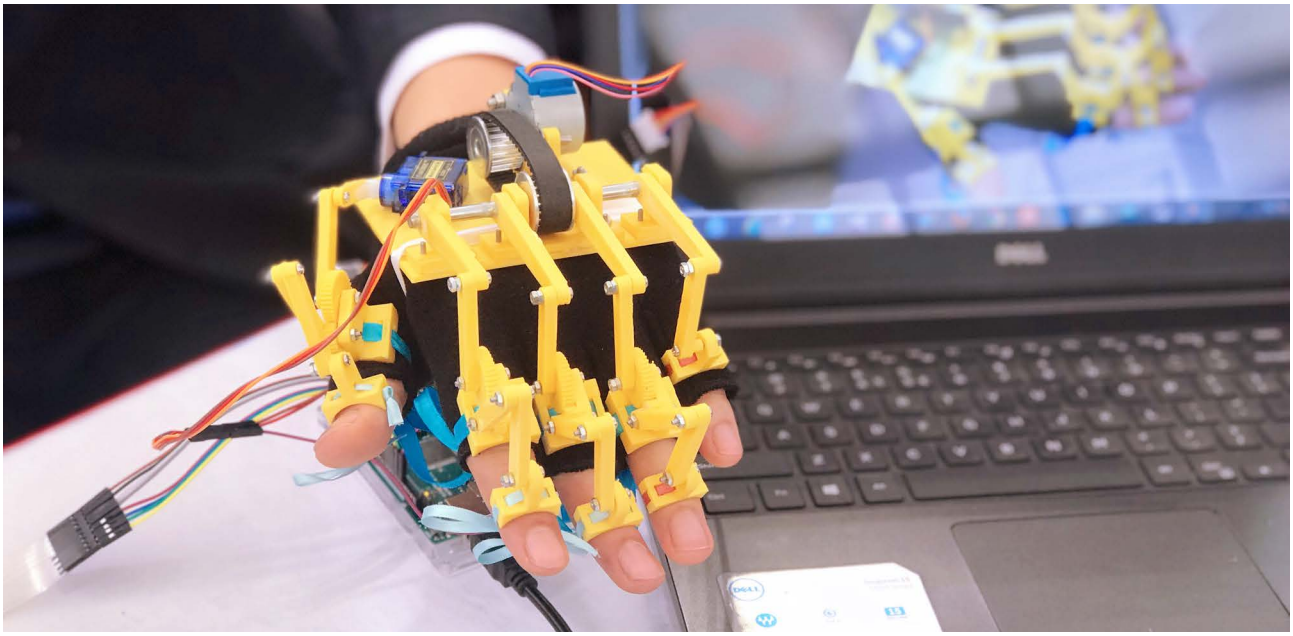
◎ Design and Application of Parallel Robots
◎ Heavy-duty Manipulating Equipment
◎ Key Technologies of New Type Mechanical Press
◎ Multi-legged Walking Machines
◎ Rescue Robots
◎ Micro-manipulating Robots
◎ Movable Soft Lander
◎ Special Robots for Nuclear Power Plants
◎ Application of Nuclear Technology and Reactor Safety

5. Institute of Mechatronics Design and Knowledge-based Engineering

◎ Micro-Channel Tubes and Application
◎ Multiscale Simulation
◎ Forming of Lightweight Material
◎ Intelligent Design
◎ Intelligent Instrument/Equipment
◎ High Performance Bearing

6. Institute of Biomedical Manufacturing and Life Quality Engineering

◎ Modular Robot and Ubiquitous Robot System
◎ Rehabilitation Robot and Surgical Robot
◎ Smart Medical Equipment
◎ Musculoskeletal System Biomechanics and Prosthesis Design
◎ Smart Materials and Artificial Organ
◎ Computer Vision and Machine Learning Technology



7. Institute of Robotics

◎ Biomechatronics
◎ Rehabilitation Robots and Neural Interfacing
◎ Surgical Robots and Medical Instruments
◎ Soft Robots and Bio-inspired Systems
◎ Precision Actuation and Control
◎ Field Robots and Rescue Applications
◎ Modular Robots and Multi-robot Systems
◎ Autonomous Unmanned Aerial Vehicles
◎ Industrial Robotic Systems and Applications

8. Institute of Mechatronics & Logistics Equipment

◎ Fluid Transmission and Control
◎ Intelligent Agricultural Equipment & Agricultural Robotics
◎ Logistics Equipment & Automation
◎ Remote Monitoring & Intelligent Maintenance
◎ Smart Elevator and Predictive Maintenance

9. Institute of Automotive Engineering

◎ Combustion and Spray Analysis
◎ Engine Control System
◎ Transmission System and Control
◎ Vehicle Chassis Technologies
◎ Vehicle Dynamics
◎ Electrified & Hybrid Powertrains
◎ Automotive Electrical Control
◎ Vehicle-to-everything (V2X) technologies

10. Institute of Digital Manufacture for Thin-walled Structures

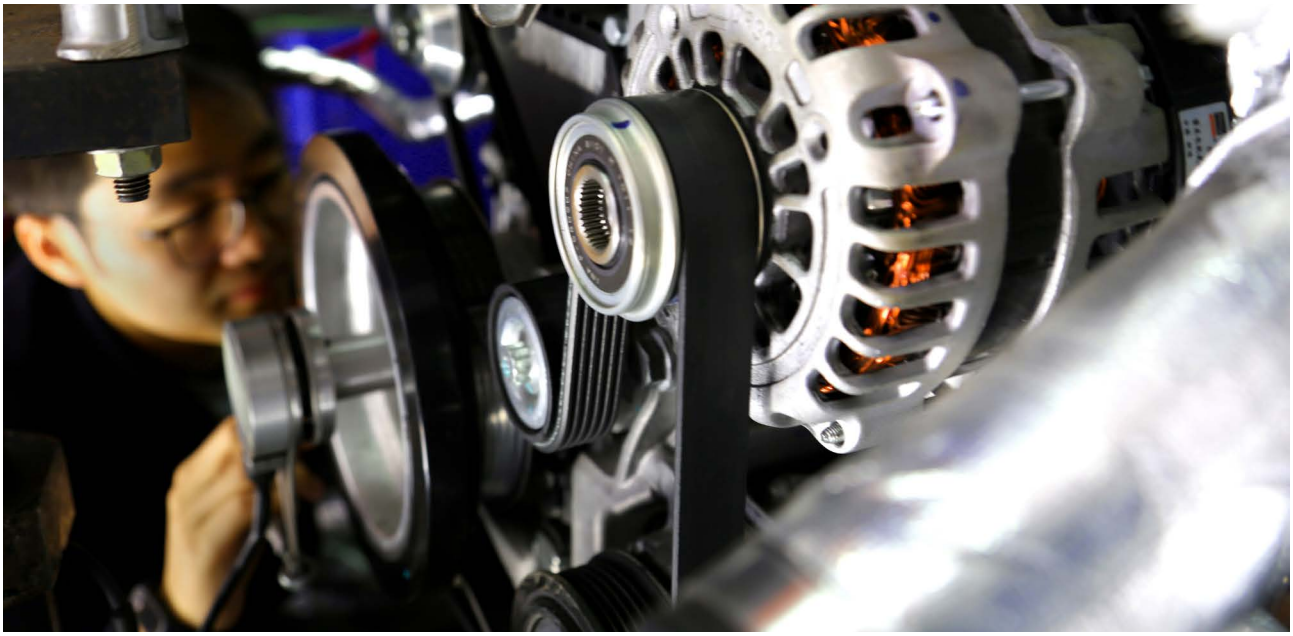
◎ Sheet Metal Forming
◎ Advanced Welding and Joining
◎ Sheet Metal Assembly Quality Control
◎ Structure Performance Analysis and Optimization
◎ Micro/Meso Manufacturing
◎ Manufacturing Equipment for Thin-walled Structures

11. Institute of Turbomachinery

◎ Gas Turbine Performance and Advanced Power Cycle Technology
◎ Gas Turbine Low-Emissions Combustion Technology
◎ Gas Turbine Thermodynamics and Aero-Acoustics
◎ High-Efficiency Turbine Blade Cooling Technology
◎ Structural Mechanics and High-Temperature Strength Analysis of High-Temperature Component and Thermal Barrier Coating
◎ Gas Turbine Distributing-Supplying-Energy Technology and Low-Grade Power Generation Technology
◎ Advanced Measurement Technology for Gas Turbine

12. Institute of Internal Combustion Engine

◎ Fuel Spray and Atomization
◎ High Efficiency and Low Emissions Internal Combustion Engine
◎ Internal Combustion Engines of Alternative Transportation Fuels
◎ Turbocharging Systems and Technologies for Internal Combustion Engine
◎ Aftertreatment Technologies for Engine Emissions Control
◎ PAHs and Soot Particle Formation and Evolution
◎ Combustion/Catalytic Reaction Kinetics
◎ Turbulent Combustion/Thermoacoustic Instability
◎ Photocatalytic Hydrogen Production



13. Institute of Thermal Energy Engineering

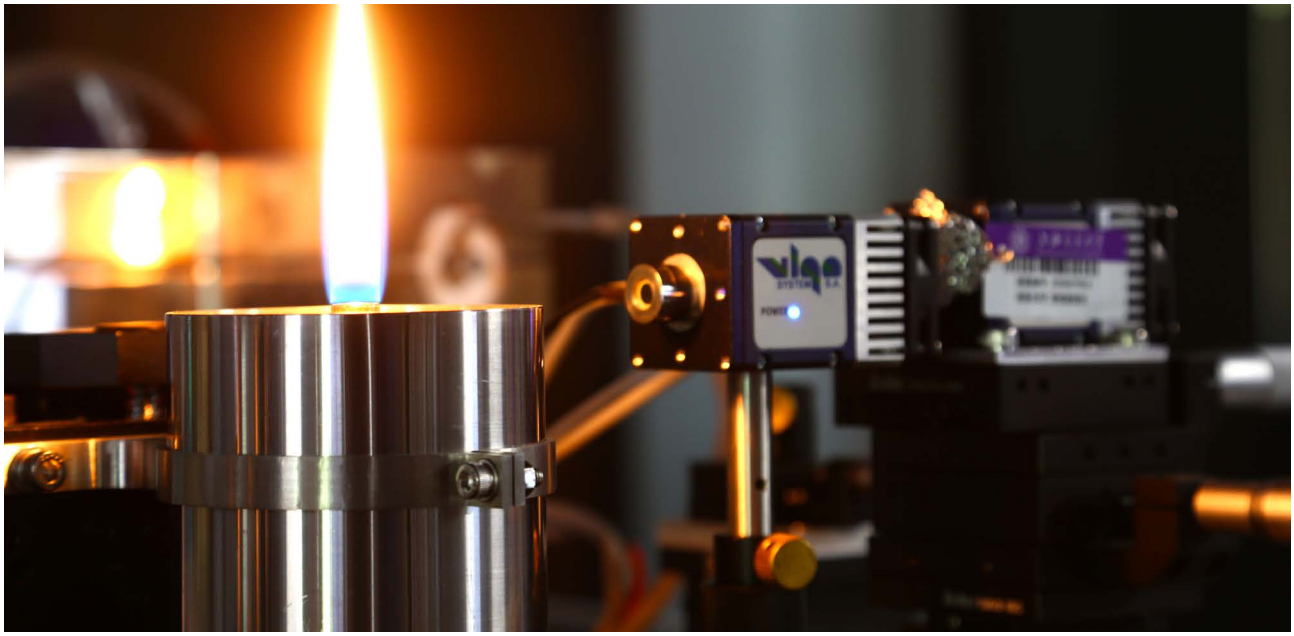
◎ Fossil Fuels Combustion and Supercritical Coal-fired Power Generation
◎ Thermo-Conversion and Power Generation of Biomass and Oil Shale
◎ Clean Energy Conversion of Solid Wastes
◎ Automatic Control and Energy Conservation of Thermodynamic Equipment and System

14. Institute of Engineering Thermophysics

◎ Heat transfer and fluid flow in micro-/nano-systems
◎ Nanoscale thermal radiation
◎ Aerothermal dynamics and Aeroacoustics in turbines
◎ Phase-change heat transfer in porous medium
◎ Thermal energy storage with phase change and thermochemical heat storage
◎ Measurements and simulations on advanced electric propulsion systems
◎ Aerodynamic heating and thermal protection of aircrafts
◎ Liquid-gas two-phase flow and boiling heat transfer

15. Institute of Refrigeration and Cryogenics

◎ Sorption Refrigeration and Heat Pump
◎ Vapor Compression Heat Pump and Applications
◎ Digital Design of Refrigeration and Heating, Ventilation and Air Conditioning Equipment
◎ Built Environment Design and Control
◎ Thermal Energy Storage (Heating and Cooling)
◎ Gas Liquefaction and Cryocoolers
◎ Solar Heating and Cooling
◎ Net Zero Energy Building and Off-grid Zero Energy Building
◎ Heat and Mass Transfer related to Heating, Ventilation and Air Conditioning & Refrigeration & Cryogenics



16. Institute of Fuel Cells

◎ Fundamentals of Electrochemistry
◎ Interfacial Electrochemistry
◎ Design of Highly Active Pt Alloy and Monolayer Electrocatalysts
◎ Synthesis of Non-Noble Metal Oxygen Reduction Reaction Electrocatalysts
◎ Kinetics and Mass Transport in Ultra-Low Pt Cathodes of PEMFC
◎ High Performance Ultra-Low Pt Membrane Electrode Assembly of PEMFC
◎ Fabrication of Low-Cost PEM Fuel Cells and Stacks
◎ Li-Ion and Lithium-Air Batteries, All-Vanadium Redox Flow Batteries
◎ System Design for Electrochemical Energy Conversion and Storage

17. Department of Nuclear Science and Engineering

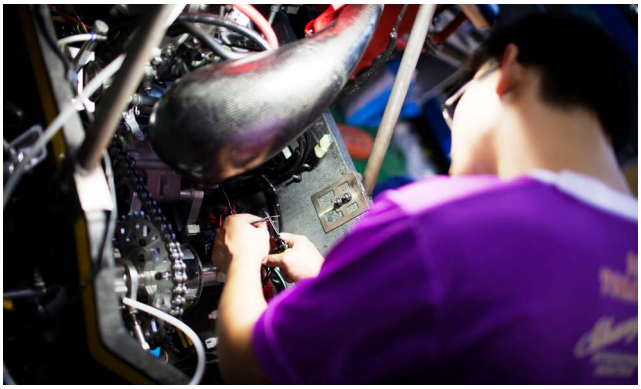
◎ Nuclear Thermal Hydraulics
◎ Nuclear Systems Design and Security
◎ Radiation Detection
◎ Nuclear Fuel Design and Cycle
◎ Nuclear Material

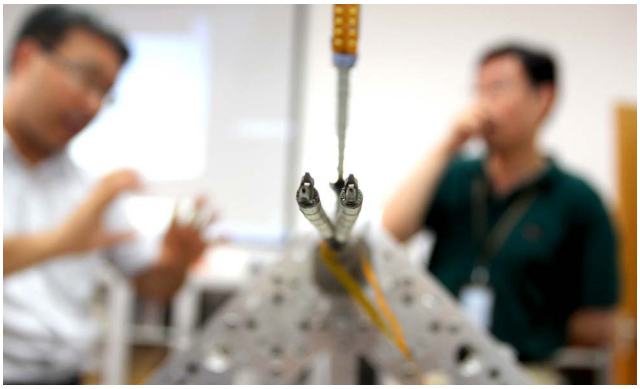
18. Department of Industrial Engineering and Management

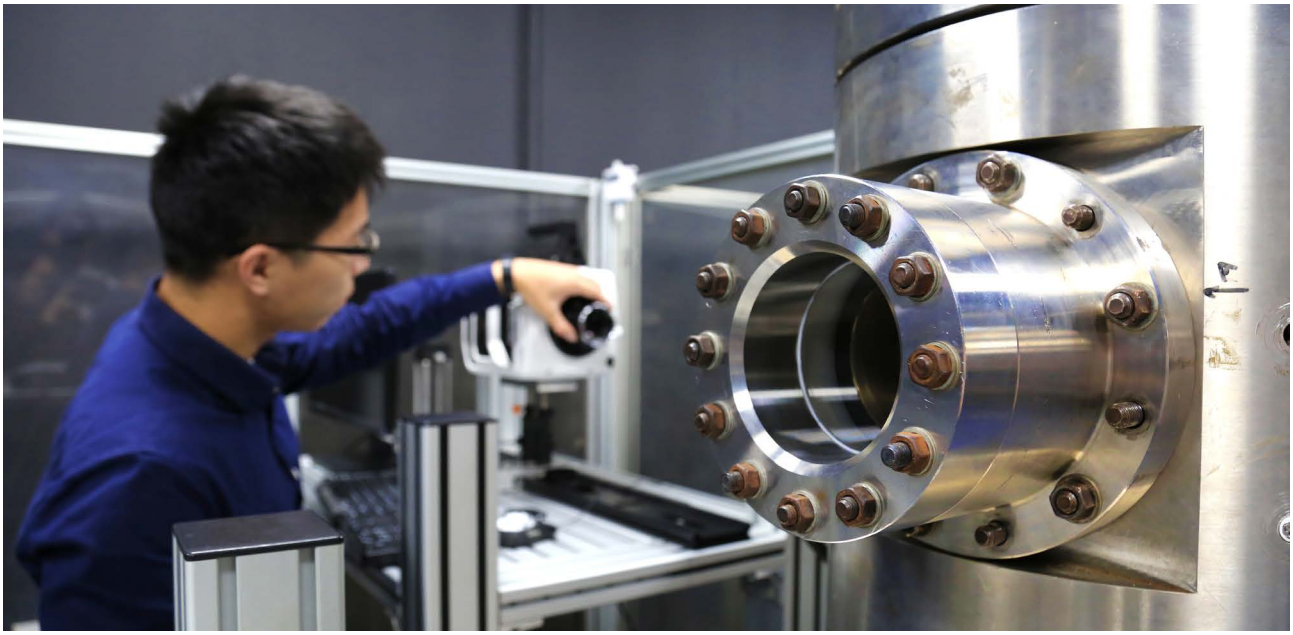
◎ Production Engineering
◎ Logistics & Supply Chain Management
◎ Quality Management & Reliability
◎ Service Engineering
◎ Product Engineering

Laboratories and Research Center

◎ State Key Laboratory of Mechanical System and Vibration
◎ National Engineering Laboratory for Automotive Electronic Control Technology
◎ National Defense Key Discipline Laboratory of Vibration, Shock and Noise
◎ National Engineering Laboratory for Reducing Emissions from Coal Combustion (Shanghai)
◎ Key Laboratory for Power Machinery and Engineering of Ministry of Education
◎ Engineering Research Center of Solar Power and Refrigeration of Ministry of Education
◎ Shanghai Key Laboratory of Digital Manufacture for Thin-walled Structures
◎ Shanghai Key Laboratory of Advanced Manufacturing Environment
◎ Shanghai Engineering and Technology Research Center of Nuclear Power
◎ Shanghai Smart Manufacturing Institute
◎ Fraunhofer Association – Shanghai Jiao Tong University Project Center for Smart Manufacturing
◎ Turbofan Technology and Engineering Institute
◎ Chinese Institute for Quality Research







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