

## **Appendix G**

### **Information about Laboratory Center of Energy and Power Engineering Program**

## 1. Introduction of laboratory center for basic experiment

Room No.	Laboratory	Course	Room area(m <sup>2</sup> )
Energy Machine Building B102	Engineering Thermophysic s Laboratory 1	Heat transfer	64
Energy Machine Building B105	Engineering Thermophysic s Laboratory 2	Heat transfer Engineering Thermodynamics Engineering Fluid Mechanics	85
Energy Machine Building B308	Fluid Mechanics Laboratory	Engineering Fluid Mechanics	123
Energy Machine Building B408	Engineering Thermophysic s Laboratory3	Engineering Thermodynamics Heat transfer	94

Equipment, administrator, opening time and rules for each of the laboratory (listed above)

Energy Machine Building B102	Engineering Thermophysics Laboratory 1
<b>1.Equipment</b>	<b>Description</b>
4 sets of heat exchanger comprehensive test bench	4 sets of customized heat exchanger comprehensive test bench
4 heat exchanger test benches	4 sets of model LL-564B heat exchanger test bench
4 test benches for heat release coefficient measurement	4 forced convection heat release coefficient measurement test benches
4 hotline wind speed suits	4 sets of testo-440 hot wire wind speed measuring devices
<b>2.Administrator</b>	2 lab technicians
<b>3.Opening time</b>	8:30-16:00 (Monday to Friday)(reserve in advance)
<b>4.Rules</b>	The laboratory can be used by both teachers and students with the company and supervision of

	working staff
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Energy Machine Building B105	Engineering Thermophysics Laboratory2
<b>1.Equipment</b>	<b>Description</b>
6 flat-plate surface layer velocity distribution test benches	6 custom-made flat surface velocity distribution test benches
5 nozzle test benches	5 nozzle test benches
1 vacuum pump	1 vacuum pump
8 sets of micromanometers	8 sets of model testo-510 micromanometers
4 test benches for heat release coefficient measurement	4 forced convection heat release coefficient measurement test benches
4 hotline wind speed suits	4 sets of testo-440 hot wire wind speed measuring devices
<b>2.Administrator</b>	2 lab technicians
<b>3.Opening time</b>	8:30-16:00 (Monday to Friday)(reserve in advance)
<b>4.Rules</b>	The laboratory can be used by both teachers and students with the company and supervision of

	working staff
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Energy Machine Building B308	Fluid Mechanics Laboratory
<b>1.Equipment</b>	<b>Description</b>
2 sets of resistance test benches along the way	2 KTL-602 resistance test benches along the way
5 self-circulation along-path resistance testers	5 self-circulation along-path resistance testers
2 self-circulating momentum experiment instruments	2 self-circulating momentum experiment instruments
3 self-circulating energy equation experimental instruments	3 self-circulating energy equation experimental instruments
5 self-circulating Renault experimental instruments	5 self-circulating Renault experimental instruments
3 self-circulating local resistance testers	3 self-circulating local resistance testers
1 self-circulating water hammer comprehensive experimental instrument	1 self-circulating water hammer comprehensive experimental instrument
1 self-circulating flow demonstration instrument	1 self-circulating flow demonstration instrument

<b>2.Administrator</b>	2 lab technicians
<b>3.Opening time</b>	8:30-16:00 (Monday to Friday)(reserve in advance)
<b>4.Rules</b>	The laboratory can be used by both teachers and students with the company and supervision of working staff



Energy Machine Building B408	Engineering Thermophysics Experiment3
<b>1.Equipment</b>	<b>Description</b>
8 thermal conductivity testers	8 hot ball heat conductors  8 sets of E-type thermocouple measuring devices  8 sets of adjustable regulated power supply  8 sets of temperature collectors
3 blackness test benches	3 RG-2 blackness test benches
6 saturated steam testers	6 saturated steam testers
4 normal radiation test devices	4 medium temperature normal radiation test devices
<b>2.Administrator</b>	2 lab technicians
<b>3.Opening time</b>	8:30 -16:00 (Monday to Friday)(reserve in advance)
<b>4.Rules</b>	The laboratory can be used by both teachers and students with the company and supervision of working staff

**2. Information about professional laboratory center of College of Energy and Power Engineering**

Room No.	Laboratory	Course	Room area(m <sup>2</sup> )
Energy Machine Building B101	Boiler Principle Laboratory 1	Superheater flow deviation experiment	51
Energy Machine Building B202	Water pump performance test laboratory	Water pump series and parallel performance test experiment	51
		Cavitation experiment	
Energy Machine Building B304	Fan performance test laboratory	Test of Fan Performance	94
		Pitot tube wind speed measurement experiment	
Energy	Frequency	Centrifugal	70

Machine Building B307	conversion energy-saving laboratory	pump frequency conversion energy saving experiment  Fan frequency conversion energy saving experiment	
Energy Machine Building B401	Steam Turbine Principle Laboratory	Blade vibration frequency measurement experiment  Eddy current test	47
Energy Machine Building B402	Open laboratory	Rankine Cycle Thermal Power Comprehensive Experiment  Comprehensive experiment of flame	52

		propagation characteristics	
		Comprehensive heat transfer experiment	
Energy Machine Building B405	Refrigeration Principle Laboratory	Refrigeration compressor performance test experiment	47
Energy Machine Building B407	Boiler Principle Laboratory 2	Flame propagation velocity measurement experiment Heat balance experiment of hot water boiler	47
Power Pavilion B105	Large-scale wind turbine laboratory	Wind power demonstration experiment	40



**Equipment, administrator, opening time and rules for each of the laboratory (listed above)**

Laboratory	Boiler Principle Laboratory 1
Room No.	Energy Machine Building B101
Room area(m <sup>2</sup> )	51
Information about laboratory	This laboratory is mainly for undergraduates, graduate students and teachers, and can complete the boiler superheater flow deviation experiment. Through this experiment, we can visually observe the uneven flow between the headers caused by different pipe connection methods.
Main experiments	1.Outdoor main water tank 2.6 sets of superheater flow deviation simulation experimental devices
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.

Laboratory	Water pump performance test laboratory
Room No.	Energy Machine Building B202
Room area(m <sup>2</sup> )	51
Information about laboratory	<p>This laboratory is open to undergraduates, graduate students and teachers. The laboratory is mainly used for research on pump performance. The pump performance test bench can test the performance curve of a single pump in operation, and can test the performance curve of two pumps in parallel and in series. The cavitation test bench can demonstrate the phenomenon of cavitation. The special glass pump can observe the fluid state in the pump body and the pump outlet when cavitation occurs, and verify the experimental observation value by calculating the cavitation height.</p>
Main experiments	<p>1. Water pump performance test bench</p> <p>2. Cavitation test bench</p>
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research

	activities by students and teachers. Rules and regulations of the Center shall be followed.
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Laboratory	Fan performance test laboratory
Room No.	Energy Machine Building B304
Room area(m <sup>2</sup> )	94
Information about laboratory	This laboratory is open to undergraduates, graduate students and teachers. The laboratory can measure the performance curve parameters of the centrifugal fan and calibrate the Pitot tube wind speed measurement device.
Main experiments	<ol style="list-style-type: none"> <li>1.Test bench for measuring fan performance curve</li> <li>2.Wind speed measurement system</li> <li>3.Pitot tube wind speed calibration test bench</li> </ol>
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.

Laboratory	Frequency conversion energy-saving laboratory
Room No.	Energy Machine Building B307
Room area(m <sup>2</sup> )	70
Information about laboratory	This laboratory is mainly used to study the efficiency of water pumps and centrifugal fans under the control of valves or dampers and under the control of frequency conversion, and the energy consumption between the other two, so as to have a deeper understanding of energy saving and consumption reduction under the frequency conversion operation mode.
Main experiments	1、 Fan frequency conversion performance test bench 2、 Centrifugal pump frequency conversion performance test bench
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.

Laboratory	Steam Turbine Principle Laboratory
Room No.	Energy Machine Building B401
Room area(m <sup>2</sup> )	47
Information about laboratory	This laboratory is mainly open to undergraduates, graduate students and teachers. This laboratory is mainly used for the testing of the vibration characteristics of steam turbine blades and the pipeline inspection of the steam turbine condenser eddy current flaw detection method.
Main experiments	<ol style="list-style-type: none"> <li>1. Low frequency signal generator</li> <li>2. Frequency measuring instrument</li> <li>3. Oscilloscope</li> <li>4. Blade and vibration generating device</li> <li>5. Eddy current flaw detection system</li> <li>6. Condenser pipe</li> <li>7. projector</li> </ol>
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and

	regulations of the Center shall be followed.
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Laboratory	Open laboratory
Room No.	Energy Machine Building B402
Room area(m <sup>2</sup> )	52
Information about laboratory	This laboratory is mainly open to undergraduates, graduate students and teachers. This laboratory is mainly aimed at the professional aspects of thermal energy and power experiments, including comprehensive heat transfer experiments, flame combustion and propagation experiments, and Rankine cycle thermal power comprehensive experiments.
Main experiments	<ol style="list-style-type: none"> <li>1.Comprehensive heat transfer experimental platform</li> <li>2. Flame propagation test bench</li> <li>3.Rankine Cycle Thermal Power Generation Comprehensive Experimental Platform</li> <li>4.Gas cylinder cabinet</li> </ol>
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research

	<p>activities by students and teachers. Rules and regulations of the Center shall be followed.</p>
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Laboratory	Refrigeration Principle Laboratory
Room No.	Energy Machine Building B405
Room area(m <sup>2</sup> )	47
Information about laboratory	This laboratory is mainly used for experiments related to the refrigeration direction of the thermal energy and power professional. Laboratory equipment can measure refrigeration cycle efficiency and compressor performance under different refrigeration conditions.
Main experiments	1.Refrigeration compressor performance test bench
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.

Laboratory	Boiler principle experiment 2
Room No.	Energy Machine Building B407
Room area(m <sup>2</sup> )	47
Information about laboratory	This laboratory is mainly open to undergraduates, graduate students and teachers. This laboratory can conduct boiler heat balance laboratory to calculate the efficiency of hot water boilers by measuring various heat losses of the hot water boiler; at the same time, it can conduct combustion experiments related to the boiler, such as flame stability concentration limit test, inner and outer flame separation experiment, hot pot Propagation speed measurement experiment, etc.
Main experiments	1.
Equipment	
People in charge	Chen Naichao
Safety officer	Liu Hailong;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.



Laboratory	Large-scale wind turbine laboratory
Room No.	Power Pavilion B105
Room area(m <sup>2</sup> )	40
Information about laboratory	<p>The large-scale wind power system practice platform is an experimental system designed for the teaching and experimental design of wind power related majors in various universities. According to the most widely used domestically-made 3MW large electric variable-pitch wind turbine, it is designed to simulate the operation mode of the wind turbine, including the simulated pitch system, unit drive system, hydraulic system, braking system and yaw system. And other functions.</p>
Main experiments	<ol style="list-style-type: none"> <li>1. Large-scale wind turbine simulation system</li> <li>2. Console</li> </ol>
Equipment	 <p>The image shows a large-scale wind turbine simulator in a laboratory. The simulator is a complex mechanical system with a large green and white nacelle mounted on a white base. It is situated in a well-lit room with large windows and industrial equipment in the background.</p>

People in charge	Chen Naichao
Safety officer	Hu Danmei;
Opening time	8:30-16:00 (working day)
Rules	The laboratory is designed for teaching and research activities by students and teachers. Rules and regulations of the Center shall be followed.