SJQU Course teaching schedule

**一、Basic information**

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| **Course code** | **2080252** | **Name** | **Fluid Mechanics & Hydraulic & Pneumatic Technology** |
| **Course credit** | **4** | **Class hour** | **64** |
| **Teacher** | **Kuihua Sun** | **E-mail** | **22461@gench.edu.cn** |
| **Class** | **B21-1** | **Classroom** |  **Online** |
| **Q & A time** |  **Online** |
| **Textbook**  | **Jianming Zuo, Hydraulic and Pneumatic Transmission, Mechanical Industry Press, 2016** |
| **Textbook References** | 《液压与气压传动》作者：许福玲 机械工业出版社 2007年10月第3版《液压与气压传动学习指导与例题集》作者：左键民 机械工业出版社 2015年6月第1版 |

**二、Teaching progress**

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| **week** | **Contents** | **Methods** | **Assignment** |
| 1 | Working principle of hydraulic and pneumatic transmission | Lecture |  |
| 1 | 1.physical properties of working oil2.theoretical knowledge of hydrostatics3. Pascal principle | Lecture | P481-5、1-61-7 |
| 2 | 1. theoretical knowledge of hydrostatics2. equation of continuity3. Bernoulli equation4. equation of momentum | Lecture | P491-8、1-14 |
| 2 | 1. Gap flow; orifice flow2. pressure loss of fluid flow3. hydraulic shock and cavitation | Lecture |  |
| 3 | 1. working principle of hydraulic pump2. calculation of main performance parameters of hydraulic pump | Lecture |  |
| 3 | 1. structural characteristics of gear pump, vane pump and piston pump2. working principle of gear pump, vane pump and piston pump | Lecture | P752-1、2-2 |
| 4 | 1. working principle and performance of Hydraulic motor 2. parameter calculation of Hydraulic motor | Lecture | P903-1、3-2 |
| 4 | 1. Classification of hydraulic cylinders2. working principle of piston cylinders, plunger cylinders and other hydraulic cylinders | Lecture | P903-3、3-4 |
| 5 | review | Lecture |  |
| 5 | 1.overview of hydraulic valves2.working principle of check valve 3.working principle of directional valve4.structure of directional valve  | Lecture | P1254-1 |
| 6 | 1.working principle of pressure valve2.Structure of relief valve, pressure reducing valve and sequence valve | Lecture | P1254-4 |
| 6 | 1.working principle of trottle valve and control valve2. working principle of crtridge valve and servo valve | Lecture | P1254-5 |
| 7 | 1.function and structure of oil tank2.function and basic requirements of filter | Lecture | P1395-1 |
| 7 | 1. composition and working principle of the pressure regulating circuit2. composition and working principle of the decompression circuit3. composition and working principle of the unloading circuit | Lecture | P1626-1、6-2 |
| 8 | 1.throttle orifice speed-regulating circuit2.volume speed-regulating circuit3.volume- throttle speed-regulating circuit | Lecture | P1636-4、6-5 |
| 8 | fast-speed movement circuit | Lecture |  |
| 9 | hydraulic system of power-slipway | Lecture |  |
| 9 | air supply devicesworking principle of cylinder and air motor | Lecture |  |
| 10 | pneumatic control valve | Lecture | P22511-1 |
| 10 | direction control valve | Lecture | P23512-2 |
| 11 | pressure control valve | Lecture |  |
| 11 | Review& exam | exam |  |
| 12 | the working principle of pneumatic actuators and pneumatic control components | Lecture |  |
| 12 |  structural characteristics of pneumatic actuators and pneumatic control components | Lecture |  |
| 13 | Control boiler door hydraulic circuit experiment (1) | Practice | Report |
| 13 | Control boiler door hydraulic circuit experiment (2) | Practice | Report |
| 14 | Control boiler door hydraulic circuit experiment (3) | Practice | Report |
| 14 | Hydraulic clamping circuit principle of double-acting hydraulic cylinder(1) | Practice | Report |
| 15 | Hydraulic clamping circuit principle of double-acting hydraulic cylinder(2) | Practice | Report |
| 15 | Hydraulic clamping circuit principle of double-acting hydraulic cylinder(3) | Practice | Report |
| 16 | Pneumatic speed control circuit | Practice | Report |
| 16 | Final exam | exam |  |
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**三、评价方式以及在总评成绩中的比例**

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| Marks （1+X） | Assessment | Weightage |
| 1 | Exam (open-book,120 minutes) | 50% |
| X1 | Experimental operation and reports | 50% |
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