☐ **Language:** ☐ 中文 | ☐ English | ☐ Čeština

☐ LSP - Logic Systems and Processors

Course: LSP (Logické systémy a procesory) —Logic Systems and Processors
School: CTU FEL Prague
Last update: 2026-01-15

☐ Overview

This repository contains complete study materials for the CTU FEL LSP course, including: - ☐ Past exams and solutions (2015–2026) - ☐ Notes and review guides - ☐ Lab tasks and FPGA projects - ☐ Practice problems and example sets - ☐ **V3.0 Exam Cram Manual** (LaTeX, tri-language CN/EN/CZ)

☐ Repository layout

```
LSP/
├── EXAM/                           # ☐  Exam materials
│   ├── 00_Study_Resources_Common/  # ☐  Shared resources (CN/EN/CZ + Printable PDFs)
│   ├── 99_LaTeX_Source_Project/    # ☐  LaTeX source project(s)
│   │   └── LSP_Revision_Master_2026/    # V3.0 LaTeX exam cram manual
│   ├── 2015-01-07/                 # Past exams (per-date folders)
│   ├── ...
│   ├── 2026-01-13/
│   ├── LSP_Ultimate_Review_Guide_EN.md  # Ultimate review guide (CN/EN/CZ + Printable PDF)
│   ├── Study_Index_Complete.md     # ☐  Master index (start here)
│   └── README.md                   # EXAM folder index
│
├── TASK/                           # ☐  Lab tasks
│   ├── 1/                          # Task 1
│   ├── 2/task2/                    # Task 2 (Quartus)
│   ├── 3/                          # Task 3
│   └── STUDOCU/                    # Studocu materials
│
├── WEEK1-13/                       # ☐  Weekly notes
│   ├── WEEK1/  - Intro
│   ├── WEEK2/  - Logic functions
│   ├── WEEK3/  - VHDL concurrency
│   ├── WEEK4/  - VHDL advanced
│   ├── WEEK5/  - LCD + process
│   ├── WEEK6/  - CMOS + simulation
│   ├── WEEK7/  - Memory + DFF
│   ├── WEEK8/  - Fixed-point + metastability
│   ├── WEEK9/  - FSM
│   ├── WEEK10/ - Control unit FSA
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|   ├── WEEK11/ - RISC-V
|   ├── WEEK12/ - Cache
|   └── WEEK13/ - Pipeline ALU
|
├── tools/                        #    Tools
|   ├── md2pdf.py                 # Markdown → PDF
|   └── batch_convert.py          # 批量转换
|
├── BinaryPrerequisite_V20.pdf    # Binary prerequisites
├── LogicCircuitsOnFPGAs.pdf      # Logic circuits on FPGAs
└── README.md                     # This file
```

☐ Core topics

1 ☐ Digital logic basics

- Boolean algebra and logic gates
- Karnaugh maps (K-Map)
- De Morgan's laws
- Shannon expansion

2 ☐ Combinational circuits

- Multiplexers / demultiplexers
- Encoders / decoders
- Adder design (full adder, +1 adder)

3 ☐ Sequential circuits

- RS latch (NOR/NAND)
- D / T flip-flops
- Registers and counters
- State machines (Moore/Mealy)

4 ☐ VHDL

- Concurrent vs sequential statements
- Signals vs variables
- Processes and sensitivity lists
- RTL view / synthesis sanity checks

5 ☐ Computer architecture

- 5-stage pipeline
- Data hazards and forwarding
- ~~Branch prediction~~ (not tested this time)
- ~~Cache~~ (not tested this time)

☐ **Exam info (Jan 2026)**

Item	Details
Date	2026-01-13 10:00
Room	KN-A-310
Duration	90 minutes
Problems	8–9
Language	Czech / English

☐ **2026 must-know (teacher-confirmed)**

1. Signed / unsigned arithmetic
2. K-Map equivalence for logic functions
3. RS latch waveform analysis
4. Shannon expansion
5. Processor pipeline

☐ **Not tested this time**

- ~~Branch prediction~~
- ~~Cache~~

See EXAM/README_EN.md

☐ **Lab environment**

- **FPGA:** Intel Quartus Prime
- **Board:** VeekMT2 (Cyclone IV)
- **Simulation:** ModelSim / GHDL
- **Language:** VHDL

☐ **Suggested study order**

1. ☐ Start with the master index: EXAM/Study_Index_Complete.md
2. ☐ Review guide (EN): EXAM/LSP_Ultimate_Review_Guide_EN.md
3. ☐ Practice: EXAM/00_Study_Resources_Common/Legacy_Selected_Examples_Collection.md
4. ☐ Do the latest 3 years (2023–2025), prioritize exams with solutions

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☐ **Links**

- ☐ [CTU FEL](CTU FEL)
- ☐ Course page

☐ Disclaimer

- For study/reference only
- Solutions may contain mistakes; official sources prevail
- Follow academic integrity rules

☐ Changelog

Date	Change
2026-01-15	Global README tri-lingualization (CN/EN/CZ) + smart links
2026-01-13	Updated index and recent exam materials (CN/EN/CZ + Printable PDFs)
2025-06	Added 2025 summer exams

Good luck with your exam!