シラバス参照

講義名	計算機アーキテクチャ特論(E)
基準単位数	2
校地	石川
科目群	情報科学系科目（石川）
科目コード	I218E
授業実施言語	英語
開講時期	2の2期

担当教員

氏名
◎ 田中　清史

曜日/時限	2の2期（火・2）／2の2期（木・1）
達成目標	Students are expected to be able to explain the basic technology for improving performance of modern computers: pipelining, cache memory, and memory hierarchy. In addition, students are expected to be able to discuss the fundamentals to construct advanced computers such as superscalar processors and multiprocessors. Furthermore, students are expected to be able to learn the ability to conduct research on computer architecture by gaining deeper knowledge of computer architecture.
概要	Understanding computer architecture, which forms the core of the IT era, is important. In this course, students will learn to understand pipeline technique, cache memory organization, memory hierarchy, branch prediction, fundamentals of superscalar processor, and organization of multiprocessors as bases of high-performance computers.
教科書	"Computer Organization and Design MIPS Edition: The Hardware/Software Interface," 6th Edition, David A.Patterson and John L.Hennessy, Morgan Kaufmann Pub., 2020, ISBN-13:978-0128201091
参考書	None
関連科目	I115 Digital Logic and Computer Design
履修条件	Students must have either fundamental knowledge about computer architecture or knowledge of I115 "Digital Logic and Computer Design".
講義計画	1. Performance vs. Cost (Measures of Performance, Cost Factor) 2. Execution of Instructions 1 (Instruction Set Architecture) 3. Execution of Instructions 2 (Single-cycle Execution) 4. Pipelining 1 (Overview of Pipelining) 5. Pipelining 2 (Pipelined Control) 6. Pipelining 3 (Hazards, Branch Prediction) 7. Pipelining 4 (Superscalar, Dynamic Pipelining) 8. Review of the 1st half and exersise 9. Memory System 1 (Cache memory) 10. Memory System 2 (Performance Analysis and Evaluation of Cache Memory) 11. Memory System 3 (Virtual Memory) 12. Memory System 4 (Memory Hierarchies) 13. Multicores and Parallel Processor 14. Review of the 2nd half and exercise
準備学修等の具体的な指示 本学では、原則15時間以上の授業を含む45時間の学修をもって1単位とすることを踏まえて、準備学修に取り組むこと。	Review concepts you learned in a previous class before attending the next one. In addition, prepare for the next class by reviewing the material in advance and understanding the relevant technical terms.

評価の観点	Comprehension level of performance, cost, and techniques for performance improvement of computers (pipelining, cache, virtual memory, and multiprocessor).
評価方法	Reports, midterm examination, and final examination.
評価基準	Reports (20%), midterm examination (40%), and final examination (40%)
獲得可能な能力・性質	・Social competencies: broad interests, logical thinking ・Creative abilities: ambition for expertise and skills, ideation ・Practical abilities: information gathering, exploratory propulsion, problem definition
講義アーカイブ	What to record : All lectures and tutorial hours How to broadcast: General (available to watch over internal network anytime)

ウインドウを閉じる