PÁZMÁNY
Pázmány Péter Catholic University
Faculty of Information Technology and Bionics

Academic Administration Office

Institutional ID: FI79633
H-1083 Budapest, Práter Str. 50/A

Master's program
Entrance examination topics

Computer Science

1. Representation of information

2. Arithmetic operational units

3. Process of instruction execution

4. Control units

5. Memories (types, properties)

6. Input / Output units, buses

7. RISC and CISC computer architectures

8. Basic data types (Stack (LIFO), Queue (FIFO), Priority Queue, Lists). Representation, implementation, and operations.

9. Data storage and retrieving (Heap, Binary search tree, B-tree, Hash table)

10. Sorting algorithms (comparison-based): Bubble sort, Insertion sort, Quicksort. Algorithms and their computational complexity

11. Essential components of programming languages: data types, control statements, function calls, and parameters. Support of parallel programming.

12. Object-oriented programming: Class, Object. Creating objects, initialization, inheritance, polymorphism, dynamic binding, abstract class.

13. Software development methodologies. Design and quality aspects. The role of the UML in software design. Testing software.

14. Components and tasks of database management systems

15. Basics of relational database management systems: Concepts: entity, relationship, relational model and relational algebra.

Recommended literature:

- Topics 1-7
  - L. Howard Pollard, *Computer design, and architecture*. Prentice Hall; 1st edition (July 1, 1997) , ISBN: 9780131672550

- Topics 8-10
  - Cormen, T. H.–Leiserson, C. E.–Rivest, R. L.–Stein,C.: *Introduction to Algorithms*. MIT Press, 2009 ISBN: 9780262033848
- Topics 11-12
  - Michael L. Scott: *Programming Language Pragmatics*. Morgan Kaufmann; 4th edition (December 25, 2015); ISBN: 9780124104099
  - Ian Sommerville: *Software Engineering (10th Edition)*. Pearson; 10th edition (April 3, 2015), ISBN: 9780133943030;
- Topics 13-15
  - Avi Silberschatz, Henry F. Korth, S. Sudarshan: *Database System Concepts*. McGraw-Hill Education; 6th edition (January 27, 2010), ISBN: 9780073523323