**PROGRAMARE PARALELA SI DISTRIBUITA**

**Cod disciplina: MLR5077**  
**Contact: virginia.niculescu@ubbcluj.ro**

**Structura curs**

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| **Curs** | **Tematica** |
| C1 | Structura cursului, Cerinte, Evaluare, Necesitatea calcului paralel si distribuit. |
| C2 | Arhitecturi paralele. Clasificarea sistemelor paralele. Cache Consistency. Top 500 Benchmarking. |
| C3 | Paralelism implicit versus paralelism explicit. Procese versus Fire de executie. |
| C4 | MPI - Message Passing Interface |
| C5 | Concurenta → mecanisme: semafoare, monitoare, variabile conditionale |
| C6 | Forme de sincronizare - exemplificari |
| C7 | Forme de sincronizare - exemplificari |
| C8 | Futures & Promises. Executors |
| C9 | OpenMP |
| C10 | CUDA |
| C11 | Masurarea performantei programelor paralele.Granularitate, Scalabilitate |
| C12 | Sabloane de programare paralela |
| C13 | Sabloane de programare distribuita |
| C14 | Analiza/Modele subiecte |

**Bibliografie:**

1. McCool Michael, Robinson Arch, Reinders James, Structured Parallel Programming: Patterns for Efficient Computation,” Morgan Kaufmann, 2012.
2. Berna L. Massingill, Timothy G. Mattson, and Beverly A. Sanders. A Pattern Language for Parallel Programming. Addison Wesley Software Patterns Series, 2004.
3. Grama, A., Gupta, G., Karypis, V. , Kumar. Introduction to Parallel Computing, Addison Wesley, 2003.
4. Grigoras, D., Calculul Paralel. De la sisteme la programarea aplicatiilor. Computer Libris Agora, 2000.
5. Foster Ian, Designing and Building Parallel Programs, Addison-Wesley 1995.
6. Niculescu V., Calcul Paralel. Proiectare si dezvoltare formala a programelor paralele. Presa Univ. Clujana, 2006.
7. Skillicorn D.B., Talia D., Models and Languages for Parallel Computation. ACM Computer Surveys, 30(2) pg.123-136, 1998.
8. B. Wilkinson, M. Allen, Parallel Programming Techniques and Applications Using Networked Workstations and Parallel Computers, Prentice Hall, 2002
9. Frank Buschmann, Kevlin Henney, Douglas C. Schmidt. Pattern-Oriented Software Architecture, Volume 4: A Pattern Language for Distributed Computing. Wiley & Sons, 2007
10. Williams A., C++ Concurrency in Action. Practical Multithreading. Manning Publications Co, 2012.
11. Tutoriale OpenMP – e.g. https://www.openmp.org/resources/tutorials-articles/
12. Tutoriale MPI – e.g. https://mpitutorial.com/tutorials/
13. Tutoriale CUDA – e.g https://developer.nvidia.com/blog/even-easier-introduction-cuda/

**Evaluare:**

**Laborator:**

- teme de tip proiect

- teme “inclass”

- test practic 1

**In sesiune:**

* Evaluare teoretica
* Evaluare practica(test practic 2)

**Calcul nota finala:**  
Nota laborator = NL  
Nota laborator "in-class" = NS  
Nota test practic1 = NM

Nota examen teoretic= NE (sesiune)

Nota test practic2 = NT (sesiune)

Nota finala = [NL\*35+NS\*5+ NE\*30+NM\*10+NT\*20]/100,

iff NE>4.5 && NL>4.5

**Informatii pentru studentii restantieri:**

Conform regulamentului, restantierii se conformeaza tuturor cerintelor promotiei curente.   
Ca urmare:

* Faptul ca in anii precedenti ati promovat activitatea de laborator, sau testul practic, sau examenul scris, isi pierde valabilitatea.
* Toate cerintele de promovare prezentate mai sus sunt sunt valabile si pentru studentii restantieri.