

Node-Level Performance Engineering

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Three-day online tutorial

VSC, TU Wien

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<http://tiny.cc/NLPE-VSC>

Course schedule day 1

Time	Day 1	Presenter
9:00	Welcome – Intro	GH
9:30	Computer architecture for software developers part 1	GW
10:00	Coffee break	
10:15	Computer architecture for software developers part 1 cont.	GW
10:45	Hands-on: Warmup (login etc.)	
11:00	Computer architecture for software developers part 2	GW
11:45	Hands-on: Divide benchmark	GH
12:30	Lunch	
13:30	Tools: Topology and affinity, frequency	GH
14:00	Hands-on: likwid-topology and likwid-pin	GH
14:30	Roofline Model: Basics	GW
16:00-	Open end	

Course schedule day 2

Time	Day 2	Presenter
9:00	Roofline Model basics (continued)	GW
9:15	Tools: performance counters	GH
10:00	Hands-on: performance counters and memory bandwidth	GH
10:45	Coffee break	
11:00	Roofline case study: Jacobi smoother	GW
12:00	Lunch	
13:00	Hands-on: Dense matrix-vector multiplication	GH/GW
13:45	Optimal use of parallel resources: ccNUMA	GW
14:30	Performance Engineering: Basic skills	GH
15:15	Coffee break	
15:30	Quiz/Q&A	GH/GW
16:00-	Open end	

Course schedule day 3

	Day 3	Presenter
9:00	Optimal use of parallel resources: SIMD	GW
10:00	Hands-on: SIMD in MiniMD	GH
11:00	Coffee break	
11:15	Roofline case study: Tall & skinny matrix-matrix multiplication	GW
11:40	Roofline case study: Sparse matrix-vector multiplication	GW
12:30	Lunch	
13:30	ECM Performance model	GH
14:15	Coffee break	
14:30	Hands-on: Matrix-free CG solver	GH/GW
16:00	Farewell & feedback	