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| Module: | Elective Advanced Lectures: Theoretical Physics |
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| Module No.: physics70c |
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| Course: |  | High performance computing: Modern computer architectures and applications in the physical science (T) |
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| Course No.: physics7505 |
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| Category | Type | Language | Teaching hours | CP | Semester |
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| Elective | Lecture | English | 2 | 3 | WT/ST |

Requirements for Participation:

Knowledge of a modern programming language like C/C++

Preparation:**Form of Testing and Examination:**

oral examination

Length of Course:

1 semester

Aims of the Course:

Understanding principles of modern computer architectures and their usage and programming for scientific problems

Contents of the Course:

Computer architectures and system components (CPU, memory, network)

Software environment

Parallel architectures and parallel programming paradigms (MPI, OpenMP/threads)

High Performance Computing

Recommended Literature:

John L. Hennessy, David A. Patterson: Computer Architecture - A Quantitative Approach. Morgan Kaufmann Publishers, 2012

David A. Patterson, John L. Hennessy: Computer Organization and Design - The Hardware / Software Interface. Morgan Kaufmann Publishers, 2013

W.H. Press et al.: Numerical Recipes in C (Cambridge University Press)

Message Passing Interface Forum: MPI: A Message-Passing Interface Standard, Version 3.1

OpenMP Application Programming Interface, Version 4.5, November 2015