

# International HPC Certification Program

Julian Kunkel<sup>1</sup>, Kai Himstedt<sup>2</sup>, Weronika Filinger<sup>3</sup>, Jean-Thomas Acquaviva<sup>4</sup>, William Jalby<sup>5</sup>, Lev Lafayette<sup>6</sup>

<sup>1</sup>:University of Reading, <sup>2</sup>:Universität Hamburg, <sup>3</sup>:EPCC, <sup>4</sup>: DDN, <sup>5</sup>: Université de Versailles Saint-Quentin, <sup>6</sup>: University of Melbourne

<https://www.hpc-certification.org/>

## Abstract

The HPC community has always considered the training of new and existing HPC practitioners to be of high importance to its growth. The significance of training will increase even further in the era of Exascale when HPC encompasses even more scientific disciplines. This diversification of HPC practitioners challenges the traditional training approaches, which are not able to satisfy the specific needs of users, often coming from non-traditionally HPC disciplines and only interested in learning a particular set of skills. HPC centres

are struggling to identify and overcome the gaps in users' knowledge. How should we support prospective and existing users who are not aware of their own knowledge gaps? We are working towards the establishment of an International HPC Certification program that would clearly categorize, define and examine them similarly to a school curriculum. Ultimately, we aim for the certificates to be recognized and respected by the HPC community and industry.

## The PeCoH Project

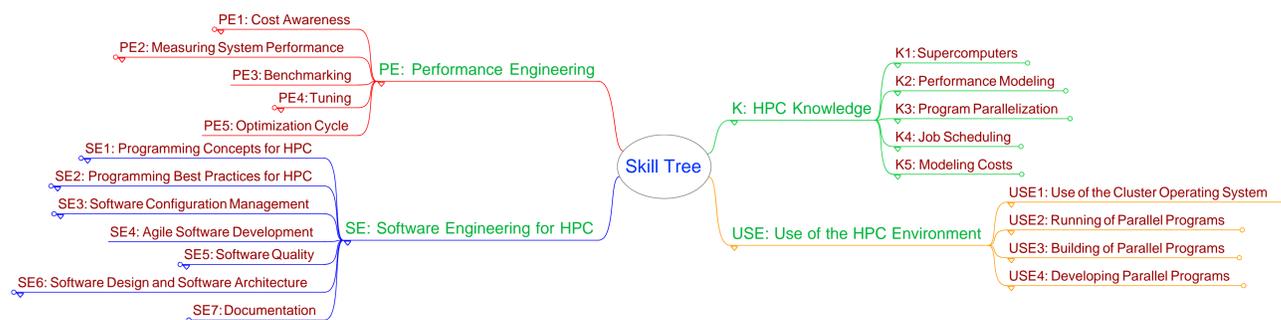
The Performance Conscious HPC (PeCoH) project\* aimed to create a lightweight HPC certification program. During the first year, it became apparent to broaden the scope and form an independent governance entity to sustain the effort and gain acceptance. Project information:

- DFG funded (runtime: 2017-2019)
- Partners
  - Universität Hamburg (UHAM)
  - Regional computing center UHAM
  - Computer Center of Hamburg University of Technology (TUHH RZ)
- Methods:
  - Competence management
  - Cost-Awareness
  - Success stories
  - Explore benefit of new concepts

\*:<https://wr.informatik.uni-hamburg.de/research/projects/pecoh/>

## Competences and Skills

Various competencies are necessary to efficiently use HPC resources. A skill is a meaningful competence that comes with a **clear definition** of knowledge/practical ability, **levels of knowledge**, **relations to other skills**. An excerpt of the first levels of the skill-tree developed by the *PeCoH* project is used as starting point:



The skill-handbook is available in various representations on the webpage and as XML on our GitHub organization: <https://github.com/hpc-certification-forum>.

## Governance Rules

We are in the process to establish rules with the members of the forum. Envisioned executive roles for the board are:

- Program chair (PC)
  - Chairs the overall executive board
  - Chairs meetings and conf. calls
- Curriculum chair (CC)
  - Decides new curriculum releases
  - Merges changes suggested by TC
- Topic chairs (TC)
  - Curate skills of a subtree (e.g., XXX)
  - Funnels change requests of members
- Examination chair (EC)
  - Manages examination handling
- Publicity chair (PRC)
  - Develops and implements PR strategy

Everyone can offer or be recommended to fill any role. Full members have voting rights; the vote with majority wins.

## Benefits

### HPC practitioners

- Increase motivation to participate
- (Certificates are recognized in CV)
- Validate knowledge via tests
- Browse of relevant competences
- Identify recommended and required skills
- Compare teaching offers across sites

### Data centers

- Increase sharing of teaching materials
- Documentation of taught skills simplified
- Identify missing teaching activities
- Tailor skill-tree specifically to users
- Correlate lack of skills with efficient use

## Get Involved!

This is an independent community-wide effort.

### Who can join?

Anyone (person or organization) experienced or interested in HPC teaching and training.

### What can we contribute?

There are various levels of contribution

- developing skill-tree scope and content
- becoming ambassador for the program
- steering of the governance body

Simply visit our website [hpc-certification.org](https://www.hpc-certification.org) and join the mailing lists!

### What does it cost to join?

It is free to join for everyone! However, for **full members** (with voting rights), we expect a minimum contribution to the overall program. Note that anyone joining will be listed on the public webpage!

### Meetings:

A general assembly of members will occur at least twice a year – presumably during ISC and SC. On a monthly basis, the program chair organizes a conference call, that shall be attended by the executive board but open to members.

### Providing teaching material:

Since the certification program itself curates the curriculum but does not provide teaching material, anyone is welcome to provide teaching material – we can help with checking and will support branding!

## Status

PeCoH delivered a concept paper, skill-tree, and a Javascript visualization. Technically, skills are stored in an XML document and can be processed via XSLT into various representations. The Javascripts can be re-used and configured by anyone – e.g., for linking teaching material.

In progress: forming a governance body.

### Responsibilities of the governance body:

- Steering the program
- Curating the curriculum
- Performing the exams

It is **not** its duty to interfere with content! We aim to preserve the teaching ecosystem.

## Next steps

A first meeting takes place during ISC-HPC to establish initial governance rules, and define next steps. Everyone is welcome to attend.

**When:** Wed. 27. Jun. 2018 12:45 – 13:30 (bring your lunch)

**Where:** Exhibition hall, Lunch area, table closest to booth N-230 (project posters)

## Acknowledgements

The PeCoH project is supported by the German Research Foundation (DFG) under grants LU 1353/12-1, OL 241/2-1, and RI 1068/7-1.