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Teaching portfolio

Pedagogical thinking and training

I am a qualified teacher in mathematics and physics. I completed the pedagogical studies 60 ECTS in my masters degree.

In the pedagogical studies, the socio constructivist learning theory was emphasized. Its idea is that teachers create a suitable situation for the students to experiment and construct the knowledge themselves. The social aspect is that if the students work in teams and then the teams debate each other the construction process becomes more active and deep. Most of the socio constructivist learning theory is reasonable and meaningful in teaching solutions. I prefer to use the tools when they are applicable.

Some necessary theory can be introduced in the classroom or via short videos. The students can utilize the ideas from examples and solve related exercises. The creative work and team work can be encouraged. Students can experiment with problems and visualizations.

Teaching and supervision experience

During 2015-2021, I have taught a broad variety of courses in mathematics (Introduction to Topology, Algebra a, Euclidean geometry, Measure and Integration Theory a, Basic Course in Fourier Analysis, Differential Calculus in Several Variables). Before this, I have supervised exercises in the mentioned courses and in the courses Analysis III, Numerical Analysis, Topology, Complex Analysis a, Introduction to Mathematics and Primitive Analysis. The scope of the lectured courses is 33 ECTS and the scope of the exercises is in total 33 ECTS + 36 ECTS.

I have also supervision experience. Based on the postdoc working period of spring 2019, I am the second supervisor of one doctoral student. I have been thrice a student tutor for Finnish students and I have assisted the international students of the department in practical matters.

I consider the exercise sessions a good place to collect feedback. The students have worked with the exercise problems and can tell whether something was easy or hard. The solutions and alternative solutions can be discussed. The students are able to point good examples which can be added. I encourage an open environment to discuss issues as they appear. In Spring 2021, one student said "Do you teach other courses? It has been so relaxed atmosphere to be here."

Based on students feedback, I have added and replaced examples in the lectures and exercises.

Contribution to teaching

I have taken part in the developing of teaching at Department of Physics and Mathematics in University of Eastern Finland. We have discussed e.g. the structure of studies, mandatory and voluntary courses, use of calculators in exams and electronic exam solutions.

At the moment, I work on Mondays for the UpTech project participating in meetings. We discuss the down-to-earth mathematics studies for engineering students. For example, several courses on "Mathematical Methods for Physicists" should be prepared. I have an upcoming full-time contract 1.6.2022-30.6.2023 for UpTech.

Myself, I have been developing visualizations in JSXGraph Javascript library. I presented a method for 3D visualizations, which the JSXGraph developers will add to the official library. A learning platform requested to use my approach to 3D visualizations.

Teaching competence

I gave my latest trial lecture on 06/2021 through Teams for my university lecturer application (Department of Physics and Mathematics in University of Eastern Finland). I was evaluated "excellent". See Appendix 1.

Production of learning materials

I have worked as a university teacher in the Department of Physics and Mathematics (UEF) in the following projects developing online course materials:

- *Multidisciplinary university level thematic entity of linear analysis* state subsidy (Ministry of Education and Culture of Finland), 2021-2022. The university teacher position started June 1st 2021 and will end May 31st 2022. In this multidisciplinary project I prepared the reorganization of the mathematics courses Linear algebra a and b and the physics courses Basics in numerical calculations and Data and Error Analysis in Natural Sciences (bilingual Fin/Eng) to online format.
- *University of Eastern Finland Continous learning separate funding*, 2019-2020. The university teacher position started 1.8.2019 and ended 31.7.2020. In this collaborative project of Department of Physics and Mathematics (Joensuu) and Department of Applied Physics (Kuopio), I prepared online materials for the courses Integral calculus and Basics in mathematics.

My responsibilities contained writing mathematical text to Digicampus Moodle platform by using HTML language and MathJax library which allows the usage of LaTeX code. I have prepared static and dynamic images via TikZ package and JSXGraph Javascript library. In addition, I have made versatile teaching videos by using a tablet and a computer. In these videos, I have used my self made slide presentations and Matlab visualizations. For the Moodle courses, I have prepared automatic evaluation Moodle quizzes, randomized STACK quizzes and CodeRunner programming quizzes.

Other merits in teaching

I am a member in

- OAJ (The Trade Union of Education in Finland).
- MAOL Pohjois-Karjala ry.
- YLL (The Union for University Teachers and Researchers in Finland) and its local group UEF YLL.
- NUME (Network for University Mathematics Educators) and have participated in their meetings.

I have participated in various events of each of these associations.

I am a member in UEFDSA (UEF Doctoral Student Association). I was a board member for three years and established the UEFDSA newspaper. In 2020, I was given the UEFDSA Julian Assange Award (Given for an excellent critical journalism and support of freedom of expression).

I have participated different teaching related events such as

- SciFest (a science festival in Joensuu)
- Integraalipäivät (event for designing classes on different topics based on talks)

Appendix 1.

I gave a teaching sample on 4.6.2021 and it was rated that I did “very well”.

The original text is:

Juha-Matti Huusko on antanut 20 minuutin pituisen matematiikan alan opetusnäytteen osana yliopistonlehtorin työhaastattelua Itä-Suomen yliopistossa 4.6.2021. Opetusnäyte annettiin etätoteutuksena Teamsin välityksellä. Huusko kävi opetusnäytteessään läpi kompleksiluvun käänteisluvun ja kompleksikonjugaatin käsitteet käyttämällä hyväksi videokameraa ja liitutaulua, sekä itse laatimiaan tietokonevisualisointeja kompleksitasossa. Mielestäni Huusko suoriutui näytteestä erinomaisesti.

Google translate (via <https://translate.google.fi/>) gives the translation:

Juha-Matti Huusko has given a 20-minute teaching sample in the field of mathematics as part of a university lecturer's job interview at the University of Eastern Finland on June 4, 2021. The teaching sample was given as a remote implementation via Teams. In his teaching sample, Huusko went through the concepts of inverse of complex number and complex conjugate, using a video camera and a blackboard, as well as computer visualizations he created himself at the complex level. I think Huusko did very well in the sample.

The original document is in the next page.



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LAUSUNTO

Juha-Matti Huusko
7.6.2021

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A handwritten signature in blue ink, appearing to read 'Risto Korhonen'.

Risto Korhonen, professori
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