

Jeong Hee Hong  
Department of Mathematics and Computer Science  
Topology, Algebra, Analysis and Geometry  
Email: hongjh@imada.sdu.dk

## 1. Formal educational training

- 1987, Certification for teachers in junior high schools and high schools, Ministry of Education, Republic of Korea.
- 1989, Training program for teaching assistants, University of Cincinnati, USA.

## 2. Administrative tasks related to education

- 2014~2018, Establishment and supervision of the Mathematical Science Lab at Korea Maritime University (it is a venue for professor-student and student-student interactions outside of lecture hours).
- 2011~2012, Head of Department of Data Information, Korea Maritime University.
- 2005~2006, Director of Center for Promotion of Women Researchers, Graduate School, Korea Maritime University.
- 2005~2006, Head of School of Mathematical and Physical Sciences, Korea Maritime University.
- 2005~2006, Director of graduate studies at School of Mathematical and Physical Sciences, Korea Maritime University, with special task of designing a new program of graduate studies in Mathematics.
- 1999~2018, Creator and main organizer of the Academic Festival at Korea Maritime University (it is an annual 3-day long event, which includes student presentations, poster sessions, invited talks by alumni and industry representatives).
- 1999~2000, Director of the Basic Research Center, Korea Maritime University.
- 1999~2000, Head of Department of Applied Mathematics, Korea Maritime University.

## 3. Teaching Experience

High school teaching experience

- Mathematics. Jangan High School, Kyungnam-do.
- Mathematics. Gohyeon Junior High School, Kyungnam-do.

Undergraduate teaching experience

- Calculus. Full responsibility for delivery and examination.
- Advanced calculus. Full responsibility for delivery and examination.
- Vector analysis. Full responsibility for delivery and examination.
- Engineering mathematics. Full responsibility for delivery and examination.
- Algebra. Full responsibility for delivery and examination.
- Introduction to real analysis. Full responsibility for delivery and examination.
- Applied real analysis. Course development, delivery and examination.
- Set theory. Full responsibility for delivery and examination.
- Discrete mathematics. Full responsibility for delivery and examination.
- Ring Theory. Teaching assistant. SDU

Graduate Teaching Experience

- Functional analysis. Course development, delivery and examination.
- Operator algebras. Course development, delivery and examination.
- Real analysis. Course development, delivery and examination.
- Hilbert space theory. Course development, delivery and examination.
- Representation theory. Course development, delivery and examination.
- Coding theory. Course development, delivery and examination.

## 4. Supervision

M.Sc. Theses

- 2008, Deug Young Go, Quantum  $SU(2)$  groups via graph  $C^*$ -algebras.
- 2005, Sang Gyu Lee, Isomorphisms of 3-dimensional quantum lens spaces.
- 2002, Sun Mi Lee, Basic construction for finite dimensional  $C^*$ -algebras.
- 1998, Ji Young Jeong, On the Hilbert space representations.

B.Sc. Projects

- 2022, Representations of finite groups. SDU
- 2021, Representations of finite groups. SDU
- 2018, Rivert-Shamir-Adelman codes.
- 2018, Modular arithmetic and applications to classical codes.
- 2017, Applications of Fourier series to engineering mathematics.
- 2017, Error detecting/correcting Hamming codes.
- 2016, Similarity of text documents by distance function.
- 2016, Similarity of 2-dimensional images by distance function.
- 2016, Fourier analysis of signal functions.
- 2015, Tessellations and computer graphics.

- 2013, Fractals and tessellations.
- 2013, Similarities and fractals.
- 2012, Systems of differential equations and mathematical models.
- 2011, Digital signals and Fourier analysis.
- 2010, The Black-Scholes equation.
- 2009, The Lotka-Volterra models.

## 5. Methods, materials and tools

Methods of teaching.

Teaching of mathematical subjects requires various approaches since the background, the needs and the expectations of the students we teach are diverse. I have taught across a range of mathematics courses, from small to large, primarily mathematics students or primarily engineering students, from first year undergraduate to M.Sc./Ph.D.

I apply different teaching techniques depending on what is needed. In most of my lectures I rely on the teaching-discussion method. I try to keep my lectures as interactive as possible, with the students actively engaged in the discussion. In particular, I encourage student/student interactions relevant to the subject and promote cooperative learning when practicable.

I always try to show and generate enthusiasm and create a friendly, supportive learning environment. I have found it important to convince my students that I sincerely care about success of their careers. As the main goal of instruction I see development of conceptual understanding of the subject matter and not merely improvement in mechanical skills.

Methods of assessment.

I have used different forms of assessment. However, it is most common in Korea to assess undergraduate courses through a written exam or a multiple-choice exam. Oral exams are sometimes used in courses given at graduate level. In advanced courses, I often used assessment of group projects, ending with an oral defense.

Supervision methods.

I normally meet with my students regularly, at least once a week, discussing progress, difficulties and ways of solving them, reviewing literature and planning for the future. As much as possible, I strive to ensure that my research students acquire breadth of knowledge beyond the relevant topic of their thesis, as a necessary platform for launching an independent career after completion. With this goal in mind, I encourage interaction between students, especially those working on interrelated projects. In particular, all B.Sc. projects I supervised involved work in groups and concluded with an oral defense which included a presentation by the students.

Educational textbooks.

- J. G. Bae, J. H. Hong and I. S. Kim, 2008 1st ed., 2012 2nd ed. Calculus for Engineering and Science (in Korean), Kyungmoon Publ.
- J. G. Bae, J. H. Hong, M. K. Jang, I. S. Kim, C. I. Park and M. J. Son, 2004, Linear Algebra for Engineering and Science (in Korean), Books-Hill Publ.

## 6. Educational awards

- 29.02.2020, Order of Service Merit, President of Republic of Korea.
- 05.11.2014, Award for distinguished academic service of 20 years, President of Korea Maritime University.

## 7. Reflection on own teaching practices

In the case of most courses I taught at university level, I was responsible for the entire process starting with designing of the course, through teaching and examination. Typically, I would teach the same course a few times in a row. This gave me the opportunity to notice the effects of my teaching and introduce changes. In making adjustments to courses, I would rely on my own observations, regularly conducted student evaluations, and discussions with my academic colleagues. What I find most important in teaching and at the same time most challenging is motivating the students and providing them with a vision how to prepare for their future. Helping the students to learn and opening new horizons in front of their eyes instead of bombarding them with tons of facts and data is very helpful. So is group work on projects where the students can clearly see their progress and achievements. Working for many years in Engineering Faculty at a Maritime University, I found it very important to teach Mathematics, even quite theoretical aspects of Pure Mathematics, in a way leading towards concrete applications. This approach has been quite rewarding. It is fun to see B.Sc. students discovering the importance of fundamental mathematical concepts for applications to modern cryptography, image recognition, etc.