Department	04 Electrical Engineering and Information Technology
Course title	**Symmetric Matrices: Theory & Applications**
Hours per week (SWS)	4
Number of ECTS credits	5
Course objective	Understanding the mathematical concepts of symmetric matrices and learning to apply them in any (almost every) engineering area.
Prerequisites	Rudiments of linear algebra would be helpful, but not necessary.
Recommended reading	D. Serre: Matrices (Theory and applications). 2.ed., Springer (2010)
Teaching methods	Seminar-style lecture with integrated exercises
Assessment methods	Written exam, grade assessment, duration: 90 minutes
Language of instruction	English
Name of lecturer	Helmut Kahl
Email	helmut.kahl@hm.edu
Link	http://arxiv.org/abs/1408.5923
Course content	Properties and Classification of Symmetric Matrices / Quadratic Forms
Quadrics / Conics with external point of symmetry
The orthogonal group (important for numerical analysis)
Several applications in Numerical Analysis
Geometric application: Computation of Plane Areas (Second Order Approximation)
Cryptographic application: Composition in imaginary-quadratic class groups
Remarks	