Exam, general

- Supporting material – esp Rottmann
- Read through all problems at the beginning (question round after max. 1 hour)
- No long calculations
- More important to show that you understand than getting the calculation perfectly right.

Syllabus

- Selected chapters in the book, lecture notes
- Problems
- Material from the whole semester is relevant, not just topics covered after the home exam

Main topics

- Complex analysis
- Ordinary DEs
- Fourier series
- Integral transforms (Fourier and Laplace)
- Tensors
- Variational calculus
- Partial DEs and orthogonal functions

Learning goals

- master the basic elements of complex mathematical analysis, including the integral theorems, obtain the residues of a complex function and to use the residue theorem to evaluate definite integrals
- solve ordinary differential equations of second order that are common in the physical sciences
- expand a function in terms of a Fourier series, with knowledge of the conditions for the validity of the series expansion

Learning goals

- apply integral transform (Fourier and Laplace) to solve mathematical problems of interest in physics
- solve partial differential equations of second order by use of standard methods like separation of variables, series expansion (Fourier series) and integral transforms
- formulate and express a physical law in terms of tensors, and simplify it by use of coordinate transforms (example: principal axes of inertia)
- Solve some simple classical variational problems.

Exam preparations

- Review lecture notes and weekly summaries
- Review weekly problems
- Do old exam problems and other relevant problems
- Put some work into writing your 4 pages of notes. Focus on what is important
- Oracle session probably June 14th