Mathematics for Engineering Mechanics 7.5 credits M7027M

Tillämpad matematik för teknisk mekanik

Course syllabus admitted: Autumn 2023 Sp 1 - Present

DECISION DATE
2022-02-14

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Mathematics for Engineering Mechanics 7.5 credits M7027M

Tillämpad matematik för teknisk mekanik

Second cycle, M7027M

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Matematik	Mathematics

Entry requirements

M0047M, M0048M, M0049M and M0013M or corresponding.

Selection

The selection is based on 30-285 credits

Course Aim

After finishing the course, the student should:

- be able to derive some well-known mathematical models (partial differential equations) within engineering mechanics, e.g.different types of wave equations and heat equations.
- know basic theory connected to generalized Fourier series and be able to apply it to solve partial differential equations. In particular, the student should be able to use classical Fourier series, sine and cosine series, Bessel series and Legendre series.
- be able to solve PDE by separation of variables and eigenfunction expansion when the domain is of the form: interval, rectangular disc, circular disc, circular cylinder or three dimensional ball.
- be able to solve partial differential equations by Fourier transformation.

Contents

Fourier series, generalized Fourier series, Bessel's equation, Bessel functions, Legendre's equation, Legendre functions, Sturm-Liouville theory, partial differential equations (PDE), Derivation of some mathematical models in applied mechanics, solving PDE by separation of variables and eigenfunction expansion, Fourier transform, solving PDE by Fourier transformation.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures and tutorials.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Home assignments which are handed in, oral presentation of home assignments and an individual oral exam.

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Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Engineering Sciences and Mathematics

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Home assignment and oral exam	G U 3 4 5	7.5	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Niklas Lehto, Programme Director 2022-02-14

Syllabus established

by Mats Näsström 2018-02-15

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