

PhD intensive course

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# DESIGN AND ANALYSIS OF MICROSYSTEMS

Assoc. Prof. Dr. G. Janušas, Department of mechanical engineering

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18 – 29 March 2019

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## About the course:

The course covers knowledge on microsystem design, materials and technologies used in the production of microsystems, methodologies and tools of quality control and experimental investigation. Students learn to create analytical and numerical models of microsystems, get acquainted with nonlinear effects in microsystems, as well as know electrostatic, thermal and piezoelectric sensors and actuators.

## Aim of the course:

The course aims at providing knowledge on numerical and experimental methods for the analysis of microsystems.

## Course format, ECTS credits:

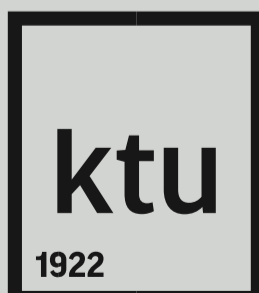
The course consists of 48 contact hours, 16 tutorial hours and 176 self-study hours, followed by an examination and two home assignments. Tasks for the both home assignments will be presented during the first lecture.

The first home assignment is the written revision of scientific papers related with the aim of this course (duration 1 week).

The second home assignment is analytical and numerical modelling of a microsystem and its analysis (duration 2 weeks).

Assessment of student's performance and study results are based on the Lithuanian 10-point scale.

Study load: 9 ECTS credits.



<https://ktu.edu/phd>

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### Target group:

The applicants will normally possess master degree in technology or in natural science.

### Main topics of the course:

- Biomechanical microsystems
- Design of periodic microstructures
- Generation of computer generated hologram
- Microstructures thermal replication using high frequency excitation
- Analysis of microstructures based on coherent optics methods
- Optical characterization of microstructures of high aspect ratio
- Design and simulation of cantilever-type microsystem
- Microresonator with electro-optic feedback
- Hybrid numerical-experimental holographic interferometry for investigation of nonlinearities in microsystems dynamics
- Composite piezoelectric material for sensors and actuators

### References:

1. V. Ostasevicius et al, Biomechanical microsystems: design, processing and applications, Springer 2017, 282p.
2. Chang Liu, Foundations of MEMS, Prentice Hall 2012, 576p.

### Course schedule:

Start date: 18 March 2019 at 9 a.m.

End date: 29 March 2019 at 4 p.m.

### Course fee:

10-day 6 ECTS course fee is 540 EUR . Travel, accommodation, and other personal expenses *are not* included in course fee.

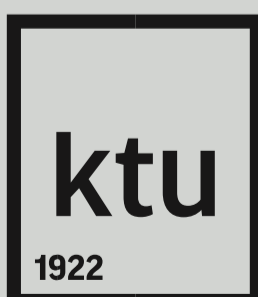
Course is free of charge for students who come to study under the Erasmus+ program.

### Registration to the course:

Send inquiry to [phd@ktu.lt](mailto:phd@ktu.lt)

Registration deadline: 25 February 2019

**Contacts:** Doctoral School, Kaunas University of Technology  
Phone: +370 626 22701, e-mail: [phd@ktu.lt](mailto:phd@ktu.lt), <https://ktu.edu/phd>



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