Module title | Abbreviation
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Telecommunication System Design | 10-l=TSD-182-m01

Module coordinator

holder of the Chair of Computer Science XVII

Module offered by

Institute of Computer Science

<table>
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<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
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<tr>
<td>10</td>
<td>numerical grade</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<td>1 semester</td>
<td>graduate</td>
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Contents

The guidance and control of spacecraft depend on reliable communication. Scientific data returned to earth are irreplaceable, or replaceable only at the cost of another mission. In deep space, communications propagation is good, relative to terrestrial communications, and there is an opportunity to press toward the mathematical limit of microwave communication with reliability as well as channel capacity in mind. Further, the effects of small changes in the earth's atmosphere and the interplanetary plasma have small but important effects on propagation time and hence on the measurement of distance. This course presents a top-down approach to communications system design. The course will cover communication theory, algorithms and implementation architectures for essential blocks in modern physical-layer communication systems (antenna, coders and decoders, filters, multi-tone modulation, synchronization sub-systems).

Intended learning outcomes

At the end of the course, students will have gone through the complete process of designing a telecommunication system for a spacecraft including the subsystems described in the table of contents. All systems involved in end-to-end telecommunication chain including principal components for implementation will be discussed during the course.

Courses

(type, number of weekly contact hours, language — if other than German)

V (4) + Ü (2)

Module taught in: English

Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes)

Language of assessment: English

creditable for bonus

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Satellite Technology (2018)