Course Syllabus

<table>
<thead>
<tr>
<th>Course Title (in English)</th>
<th>Communication Technologies for Internet of Things</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title (in Russian)</td>
<td>Коммуникационные технологии для Интернета вещей</td>
</tr>
<tr>
<td>Lead Instructor(s)</td>
<td>Lakontsev Dmitry</td>
</tr>
</tbody>
</table>

Is this syllabus complete, or do you plan to edit it again before sending it to the Education Office?
The syllabus is a work in progress (draft)

Contact Person

Dmitry Lakontsev

Contact Person’s E-mail
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1. Annotation

Course Description

This is a newly developed course that prepares students for the applying modern telecommunication technologies, both wired and wireless in the Internet of Things area. The course combines lectures and labs related to hardware, transmission techniques, the medium-access control layer, networking, applications and standards for the IoT communication technologies. All technologies are considered with use-case based approach that shows their practical application in real industrial and research scenarios.

Course Prerequisites / Recommendations

Basic programming
Basic Matlab

2. Structure and Content
Course Academic Level: Master-level

Number of ECTS credits: 3

3. Assignments

<table>
<thead>
<tr>
<th>Assignment Type</th>
<th>Assignment Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>Written homework covering main topics of the course.</td>
</tr>
<tr>
<td>Homework</td>
<td>Practical homework covering one of the technologies considered in the course.</td>
</tr>
<tr>
<td>Team Project</td>
<td>Project is aimed to reproduce the results one of the modern papers dedicated to IoT telecommunication technologies.</td>
</tr>
</tbody>
</table>

4. Grading

Graded

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Activity weight, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments</td>
<td>25</td>
</tr>
<tr>
<td>Lab Reports</td>
<td>25</td>
</tr>
<tr>
<td>Projects</td>
<td>25</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
</tr>
</tbody>
</table>

Grading Scale

A: 80
B: 70
C: 60
D: 50
E: 46
F: 0

Attendance Requirements: Mandatory with Exceptions

5. Basic Information
Maximum Number of Students

<table>
<thead>
<tr>
<th></th>
<th>Maximum Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall:</td>
<td>24</td>
</tr>
<tr>
<td>Per Group (for seminars and labs):</td>
<td>12</td>
</tr>
</tbody>
</table>

### Course Stream
Science, Technology and Engineering (STE)

### Course Term (in context of Academic Year)
Term 2

### Course Delivery Frequency
Every year

Students of Which Programs do You Recommend to Consider this Course as an Elective?

#### Masters Programs
- Advanced Manufacturing and Materials
- Computational Science and Engineering
- Data Science
- Petroleum Engineering

#### PhD Programs

Course Tags
Engineering

6. Textbooks and Internet Resources

7. Facilities

#### Equipment
IoT Lab equipment

#### Software
Matlab
ns-3 discrete-event network simulator

Labs for Education
IoT Lab (TPOC4: 346)

8. Learning Outcomes
### Knowledge

- Knowledge about a wide range of IoT requirements to telecommunication systems.
- Basic knowledge about radio propagation.
- Knowledge about all mainstream telecommunication technologies in IoT area.
- Knowledge about metrics and parameters for performance evaluation of telecommunication technologies.
- Understanding of the research process, research ethics, and academic integrity.
- Basic knowledge of mathematical and simulation modeling for communication networks performance evaluation.

### Skill

- Ability to choose appropriate telecommunication technology for particular IoT use case.
- Ability to estimate, with the help of different techniques, performance characteristics of telecommunication technology for particular IoT use case.
- Ability to setup and deploy modern IoT telecommunication equipment.

### Experience

- Students will be able to read, discuss and present research results, novel problems, their potential solutions, and applications in IoT area, as well as provide written materials on these matters.
- Students will be able to design and deploy telecommunication networks for IoT use cases.

### 9. Assessment Criteria

- Input or Upload Example(s) of Assignment 1:
- Input or Upload Example(s) of Assignment 2:
- Input or Upload Example(s) of Assignment 3:
- Input or Upload Example(s) of Assignment 4:
- Input or Upload Example(s) of Assignment 5:

### 10. Additional Notes