Governance of National Innovation Systems (NIS)

1. **Introductory note**

   Program authors: Dirk Meissner

   **General Description of the Program:**
   The course is delivered to master students. It is a part of general scientific curricula unit, and it is delivered in modules. The course length is 108 academic hours in total of which 30 hours are classroom hours and 78 are devoted to self study. Academic control forms are one written exam and one essay.

   **Course Objective**
   The course spans 1 academic module. Students are assessed with a written exam. The teaching is based on selected writings and experiences of faculty members. In addition selected reputed scholars and experts are invited bringing together views from different perspectives on the meaning of intellectual property for science, technology and innovation to provide in-depth learning opportunities for all students.

   Lectures are designed to deliver theoretical frameworks and international experiences. The course is accompanied by a seminar, and some sessions will feature additional foreign experts. Accompanying seminars introduce and develop new approaches to understand and further develop different facets of innovation thinking and to provide participants with ready to use state of the art knowledge as well as academic training.

   **Course Language:** English.

   **Abstract**
   It is a common wisdom that innovations are generated in more or less complex ecosystems which are characterized by multiple linkages between actors and members and spillovers. Although this has been known for a long time there is no generally accepted response to the challenge how to organize innovation ecosystems. Such ecosystems are found in companies, in universities and research institutes but also in regions and nations. Literature and practice suggest the concepts of national and regional innovation systems respectively. These models assume that actors in specified ecosystems simply exchange knowledge, inventions, innovations, ideas and many other related things finally generating innovation which is considered a driver for economic growth and social welfare. The most recent generation of innovation ecosystems goes beyond this thinking granting more freedom of choice to act to individual actors – systems innovation. However the challenge remains to design systems of governance which combine consistent and coherent policy making, priority setting at different levels, granting reasonable freedom to act but also set reliable framework conditions.

   The course throws a light on the theories and concepts of innovation ecosystems at company level, regional level and national level. Furthermore the linkages between company ecosys-
tems, regional and national systems but also at international level will be discussed. Eventually the course teaches approaches towards developing and governing such innovation ecosystems.

**Training Objectives**

- Multiple layers in innovation systems
- STI strategy making in complex environments
- Implementation of STI strategies in NIS
- Ecosystem concept – definitions and elements
- Innovation climate and innovation culture
- Linkages in networks and ecosystems
- Framework conditions for innovation in ecosystems
- Company, regional and national innovation ecosystem – characteristics and synergies
- Competition and cooperation within and between innovation ecosystems

**Target audience**

- Master students
2. **Thematic Plan**

a) Lectures

<table>
<thead>
<tr>
<th>Module</th>
<th>Topic</th>
<th>Course hours, total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structures of NIS</strong></td>
<td>STI governance models I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>STI governance models II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Global governance of STI and the role of international organizations I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Global governance of STI and the role of international organizations II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>total</strong></td>
<td><strong>8</strong></td>
</tr>
<tr>
<td><strong>STI Priority setting</strong></td>
<td>STI priority setting I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>STI priority setting II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>total</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td><strong>STI in Russia</strong></td>
<td>Governance of STI in Russia I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Governance of STI in Russia II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>total</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td></td>
<td>Looking forward: future STI governance models</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

a) seminars

The seminar consists of an introductory session which highlights the phenomena in discussion, introduces the theoretical background and practical applicability. Following introductory session students will develop a practical applicable concept for a given problem which is based on sound scientific grounds. The session ends with the introduction of core themes for which the students are asked to prepare a presentation. Finally these concepts are introduced in a concluding session which is devoted to presentations of concepts developed by students and a concluding discussion of these concepts from both a scientific and a practical view. Students will develop concepts in teams and be supervised during development of their concepts.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Total academic hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory presentation</td>
<td>4</td>
</tr>
<tr>
<td>Presentations</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

3. **Basic literature**

4. **Education control forms**

Final control (F): written exam (60 minutes)
Seminar (S): essay (E) and oral presentation (defence – D) at the end of the seminar.

The overall course grade (10-point scale) is calculated as a sum of

\[ G = 0.5 \, F + 0.5 \, S \]
\[ S = 0.5 \, E + 0.5 \, D \]

The overall course grade \( G \) (10-point scale) includes results achieved by students in their exam \( F \), seminar (\( S \)); it is rounded up to an integer number of points.

**Summary Table: grading scale**

<table>
<thead>
<tr>
<th>Ten-point scale [10]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – unsatisfactory</td>
</tr>
<tr>
<td>2 – very bad</td>
</tr>
<tr>
<td>3 – bad</td>
</tr>
<tr>
<td>4 – satisfactory</td>
</tr>
<tr>
<td>5 – quite satisfactory</td>
</tr>
<tr>
<td>6 – good</td>
</tr>
<tr>
<td>7 – very good</td>
</tr>
<tr>
<td>8 – nearly excellent</td>
</tr>
<tr>
<td>9 – excellent</td>
</tr>
<tr>
<td>10 – brilliant</td>
</tr>
</tbody>
</table>
Module 1 - Structures of NIS

Topic 1  STI governance models I

Topic outline:
- Federal and regional levels
- Agencies, ministries, universities and research institutes
- Triple helix approach
- The meaning and role of innovation funding agencies

Main references/books/reading:

Topic 2  STI governance models II

Topic outline:
- Definition of innovation ecosystems
- Company and PRI ecosystems

Main references/books/reading:

Topic 3  Global governance of STI and the role of international organizations I
Topic outline:
- Ambitions, missions and strategies of different ecosystems
- Complementarities and competition

Main references/books/reading:

Topic 4  Global governance of STI and the role of international organizations II

Topic outline:
- Actors’ needs and requirements towards NIS
- Design of policy and implementation

Main references/books/reading:

Module 2 – STI priority setting

Topic 1  STI priority setting I/II

Topic outline:
- Allocation of budgets
- Limitations and potentials of cooperation and competition

Main references/books/reading:
Module 3 - STI in Russia

Topic 1  Governance of STI in Russia I/II

Topic outline:
• The Russian NIS

Main references/books/reading:

Topic 2  Looking forward: future STI governance

Topic outline:
• future governance models
• trends and developments in NIS governance

Main references/books/reading:
• OECD Science, Technology and Industry Outlook 2014