GRADUATE SCHOOL OF INTERNATIONAL STUDIES
SEOUL NATIONAL UNIVERSITY
Spring 2021

UNDERSTANDING SCIENCE, TECHNOLOGY, INNOVATIONS AND DEVELOPMENT

Time: Tuesday 14:00 - 16:50.
Place: Zoom Room or Room 140-2-202.
Course Number: M2050.000800.
Instructor: Hyeok Jeong (Email: hyeokj@snu.ac.kr, Tel: 02-880-2921).
Office Hour: Tuesday 17:00 - 17:50 with appointment.

Last Update: January 18, 2021.

Course Keywords

Science, Technology, Innovations, Development, Economic Growth, Smart City, Information, Data, Artificial Intelligence.

Course Description

Science and technology have changed via myriads of accidental or intentional innovations and discoveries, influencing diverse aspects of human life and society, and its process of development. Meanwhile the conditions of socio-economic development themselves have critical impacts on the individual incentives and environments of innovations, hence the progress of science and technology. This way, science, technology, and development co-evolve with each other.

Science is about finding or organizing ideas in order to understand the internal or external surroundings of humans, while technology is about implementing or representing the ideas. Thus, science and technology are two different kinds of channels of idea generation, although they are closely related. Regarding the above mutual influences between science-technology and socio-economic development of human society, technology is more direct channel than science.

The innovations tend to disturb the existing social and economic orders by creating uncertainties, so that the consequences of those innovations on economic growth and social welfare are hardly predictable. Their eventual destination

depends on the policy and institutional responses as well as individual choices over them, which may differ across nations. Furthermore, due to the fundamental non-rivalry of ideas, their impacts are not confined within national borders. Global development and international inequality would be shaped by the mega trends of science and technology innovations. Recent examples include the advent of the artificial intelligence and the smart cities utilizing big data. Understanding such science and technology innovations which would affect the fundamental modes of human life provides us with a radar for the uncertain direction of the future development of human society. This course aims to understand the nature and causes of such co-evolution between the innovations of science and technology and the socio-economic development and their consequences on the global as well as national development.

This class consists of ten sessions of lectures and five sessions of group presentation. We may adjust the time allocation between lectures and group presentations if necessary. The size of each group depends on the total number of students. After learning core materials of empirics and theories regarding the co-evolution of science, technology, and socio-economic development from the lecture sessions, students need to present a research project applying the learnings to the contemporary global or national development issues with specific policy suggestions. The scope of research project is wide open from the traditional development agendas of urbanization or structural transformation to cutting-edge agendas of smart city design or socio-economic impacts from AI. Each presentation group is required to write a policy report based on the its presentation and the learnings from the lectures.

Evaluation

Course grade will be based on (i) take-home midterm exam (30%) (ii) class presentation (20%), (iii) final policy report (30%), and (iv) class participation (20%). Class participation grade will be measured by (i) attendance (10%), and (ii) the quality of student's answers and questions that are considered to significantly

contribute to the class (10%). For the online class meetings, every student needs to turn on camera so that the TA can monitor the class participation. The student whose camera is off will be counted as absence.

Keeping class etiquette is required. If meeting off line, no cell phones including text messaging is allowed. If meeting online, non-class activities such as eating, sleeping, or talking on the phone are not permitted. For any negative disruptions to class, negative participation grade will be given.

This course does not allow alternative dates of exams, presentation, and submission of final report except for student's own health reason, which needs to be proved by official medical documents provided by non-family member doctors. For any cheating behavior, students will fail the course without exception.

According to the revised SNU school rule (the 4th Clause of the Article 85), effective date of September 1st in the year 2018, any students who attend less than two-thirds of the required classes will receive a grade of "F "or "U" with exception of inevitable cases which is upon discretion of the instructor.

Instruction for Online Class

Due to the Covid-19 pandemic situation, we will do the lectures, presentations and discussions via Zoom. The URL of the login site of Zoom is https://zoom.us. You can create the login ID for Zoom by using your SNU email ID or by obtaining license from the IT Center (phone: 02-880-8282, email: zoom_tf@snu.ac.kr). The Zoom meeting ID and password for this class will be informed to the registered students by emails from TA. Class materials (reading assignments, presentation files and schedules) and the announcement of the class logistics will be posted on SNU eTL.

Course Outline

Part I. Nature of Changes of Science and Technology

1. Brief History of Scientific and Technological Discoveries

2. Core Concepts and Perspectives in Understanding the Changes of Science and Technology

3. Mutual Influences between Science-Technology and Socio-Economic Orders

4. Nature of Innovations

Part II. Role of Technological Changes on Economic Development

5. Theoretical Models of Technological Changes on Economic Growth

6. Theoretical Perspectives of Innovations

7. City and Development

8. Information, Data, Artificial Intelligence, and Development

9. Implications on Global Development

Part III. Group Presentations with Policy Applications

Remark 1. When the time constraints prevail, we may rearrange the above topics.

Remark 2. This syllabus is written on January 18, 2021. It may be necessary to make adjustment during the semester upon contingencies.