Course Descriptions

▣ Undergraduate Program

TS211 Reading Great Books on Human Intelligence and Civilization: Human Intelligence 3:3:3(6)

This class is designed to allow students to draw intellectual topographic maps of intellectual civilization that have been achieved by mankind for thousands of years through great book reading and discussion. In particular, books on the approaches of philosophy (epistemology), psychology, brain science, psychiatry, and neurology on humans will be selected. We would like to select 17 books related to human intelligence and to discuss key questions to answer from my own perspective to give them unique and proper views. We let them write own thoughts in the form of book reviews or YouTube video monologues.

TS212 Reading Great Books on Human Intelligence and Civilization: Society 3:3:3(6)

This class is designed to allow students to draw intellectual topographic maps of intellectual civilization that have been achieved by mankind for thousands of years through great book reading and discussion. The class will include books on sociology, history, anthropology, archaeology, and economics. We would like to select 15 books related to individuals and society, and to discuss key questions to answer from my own perspective to give them unique and proper views. We let them write own thoughts in the form of book reviews or YouTube video monologues.

TS221 Social Innovation Lab with Technology Ⅰ: Design 3:3:4(6)

This class is designed to allow students themselves to find social problems facing mankind and make their own solutions through technology. First of all, they find important and solvable social problems, then explore various solutions and evaluate them. Then they design technological products or services that can be made within one year or less. In this class, we determine the social issues that we are supposed to figure out, and come up with ideas to solve them. To this end, we design fabrication and experimentation and get insight from pilot results into specific solutions. During the class, they take the necessary classes and study the necessary knowledge together, and come up with solutions through collaboration. They should share the final outcomes at the end of the semester and discuss critically about the results made by each team.

TS222 Social Innovation Lab with Technology Ⅱ: Prototyping 3:3:4(6)

This class is designed to allow students themselves to find social problems facing mankind and make their own solutions through technology. First of all, they find important and solvable social problems, then explore various solutions and evaluate them. Then they design technological products or services that can be made within one year or less. Based on rough prototypes for social issues and ideas (such as products or services, technology patents, policy proposals, etc.) found the last semester, we present specific solutions to social problems by revising and improving them. During the class, they take the necessary classes and study the necessary knowledge together, and come up with solutions through collaboration. They should share the final outcomes at the end of the semester and discuss critically about the results made by each team.

TS251 Data Science Overview 3:0:3(6)

The goal of this course is to get students to have a principled understand of data science, encompassing the essential elements of the field, including a set of principles, problem definitions, data process and manipulation techniques, algorithms, and tools.

TS323 Social Innovation Lab with Technology (III): Design 3:3:4(6)

This is the 1st half of the 2-semester-long PBL course as the second year program of the 'learn-by-dong' curriculum in School of Transdisciplinary Studies. Each student will be provided with ample opportunities to cultivate transdisciplinary thinking and creative practical problem-solving skills, developing a specific technological solution to an important social issue via intensive team activities. During the spring term, we will focus on developing problem definition and basic prototyping skills needed to implement the technological

solution to the problem.

TS324 Social Innovation Lab with Technology (IV): Prototyping **3:3:4(6)**
This is the 2nd half of the 2-semester-long PBL course as the second-year program of the 'learn-by-dong' curriculum in School of Transdisciplinary Studies. The course focuses on implementing the technological solution to the problem defined over the last term. In addition, students will be introduced to knowledge on intellectual property and the process of invention disclosure.

TS325 Reading Great Books on Human Intelligence and Civilization: Universe **3:3:3(6)**
This class is designed to allow students to draw intellectual topographic maps of 'Universe' that has been investigated by mankind for thousands of years through great book reading and discussion. We would like to select 15 books related to Universe and to discuss key questions to answer from my own perspective to give them unique and proper views. We let them write own thoughts in the form of book reviews or YouTube video monologues.

TS326 Reading Great Books on Human Intelligence and Civilization: Life **3:3:3(6)**
This course is designed to provide students with essential knowledge on human anatomy and physiology (A&P) as one of the most crucial components of healthcare. Students will learn how the human body works, how it maintain its normal functions and what the consequences of injury or disease are. Clinical implications and contemporary healthcare applications will also be covered.

TS340 Human Anatomy & Physiology **3:0:3(6)**
This course is designed to provide students with essential knowledge on human anatomy and physiology (A&P) as one of the most crucial components of healthcare. Students will learn how the human body works, how it maintain its normal functions and what the consequences of injury or disease are. Clinical implications and contemporary healthcare applications will also be covered.

TS342 Introduction to Human Disease **3:0:3(6)**
The goal of this course is to provide students with the general vocabulary used to discuss and classify diseases, an overview of the resources commonly used in diagnosis., a feeling for the general frequency and significance of particular diseases, and an understanding of clinical implications on them.

TS343 Bio-Sensing & Life-Log Based eHealth & Medical IoT Projec **3:0:3(6)**
In this project-based course, not only will fundamental knowledge and skills on various types of bio-sensing and IoT-enabled life-loping technologies be given to students, but also they will be provided ample opportunity to prototype creative healthcare, wellness and/or small-scale environmental applications based on their active learning combined with the given knowledge and skills.

TS344 IoT-Enabled Social Innovations **3:0:3(6)**
In this active learning course, students will be given not only fundamental knowledge and skills on IoT-enabled sensing and life-logging techniques through micro python embedded programing, but they will also be provided ample opportunity to prototype practical creative social applications based on a modular ESP32 IoT development board.

TS350 Problem Definitions for AI Applications **3:0:3(6)**
This course is designed to provide students with active-learning experiences to develop ability to properly identify/define problems/issues in a wide range of areas, applying AI technology. Major AI research topics and relevant case studies will be introduced and analyzed from the perspective of 'applied AI'. In addition, through active learning activities, students will be given ample opportunities to identify and discuss over a variety of problems/issues that are expected to be solved more effectively by applying AI technology.

TS401 Statistical Data Science Practice **3:0:3(6)**

This course provides students with hands-on experience of analyzing real-life data examples using advanced statistical and machine learning methods. In addition, effective oral and written communication of methods and results are emphasized.

TS421 Social Innovation Lab with Technology (V): Design **3:3:4(6)**

This is the 1st half of the 2-semester-long PBL course as the 3rd year program of the 'learn-by-dong' curriculum in School of Transdisciplinary Studies. Students will be given ample opportunities to cultivates transdisciplinary thinking and relevant design/implementation skills, understanding a wide range of global issues (e.g., UN-SDGs), identifying a specific problem, and designing a technological solution to the selected issue via intensive team activities. During the spring term, we will focus on developing problem definition and basic prototyping skills needed to implement the technological solution to the problem.

TS422 Social Innovation Lab with Technology (VI): Prototyping **3:3:4(6)**

This is the 2nd half of the 2-semester-long PBL course as the 3rd year program of the 'learn-by-dong' curriculum in School of Transdisciplinary Studies. The course focuses on implementing the technological solution to the problem related a global issue which was defined over the preceding semester, applying agile methodology. In addition, students will be encourage to have knowledge on intellectual property and go through the process of invention disclosure.

TS423 Reading Great Books on Human Intelligence and Civilization: Technology **3:3:3(6)**

This class is designed to allow students to draw intellectual topographic maps of 'Technology' that has been developed by humans for thousands of years through great book reading and discussion. We would like to select 17 books related to Technology and to discuss key questions to answer from their own perspectives to give them unique and proper views. We let them write own thoughts in the form of book reviews or YouTube video monologues.

TS424 Reading Great Books on Human Intelligence and Civilization: Arts **3:3:3(6)**

This class is designed to allow students to draw intellectual topographic maps of intellectual civilization that have been achieved by humans for thousands of years through great book reading and discussion. We would like to select 17 books related to arts, and to discuss key questions to answer from their own perspectives to give them unique and proper views. We let them write own thoughts in the form of book reviews or YouTube video monologues.

TS441 Big Data Analytics in Healthcare **2:3:3(6)**

This course provides students with practical knowledge and skills on how to perform health-related big data analysis, using one of the most widely used data science tools, R. Students will learn how to deal with various types of data, conduct conventional statistical analyses, build accurate machine learning models and confidently complete predictive analytics.

TS442 Assistive Technology for People wit Special Needs **3:0:3(6)**

This course is a team-based Rehabilitation Engineering and Geron-Technology (RE/GT) design project. Each student will be a part of a project team, propose a RE/GT project idea and carry out the project over the semester. While students conducting the RE/GT projects, the instructor will provide a lecture on the relevant topics each week and facilitate the completion of the team projects.

TS443 Healthcare Product and Service Design **3:0:3(6)**

This is a culminating and integrative design course offered to senior students. Students will work in teams to design a real-world healthcare product or service, having opportunities to go through the whole design process along with relevant lectures and workshops ranging from ideation to commercialization.

TS446 Transdisciplinary Research Design & Methodology **3:0:3(6)**

This course is designed for students who are interested in developing knowledge and skills required to do research in the transdisciplinary context. The course breaks down the process designing and doing a research project into achievable stages, take learners from research problem to a written research report, helping them find relevant support and delop skills at every stage.

TS450 Human Affect Recognition **3:0:3(6)**

This active learning course, which is supported by Google-KAIST Partnership Grant, aims at proving students who have basic knowledge and skill on AI with culminating and integrative learning experience. They will be given ample opportunity to learn how to process multimodal data (e.g., text, audio, image) and apply deep learning techniques, working on human affect recognition tasks with most widely used open source python libraries and relevant cloud APIs.

TS472 Special Topics in Transdisciplinary Studies **3:0:3(6)**

This course covers current topics in 6T (IT, BT, NT, ET, CT, and ST) from the perspective of transdisciplinary science and technology. The course includes intensive discussion over relevant academic papers, government/industry reports and seminars on the selected topic. This course is suitable for senior level undergraduate students.

TS490 Undergraduate Thesis Study **0:6:3(6)**

Students in this course conduct a research-oriented individual project related to his/her focused academic area. All work is conducted, on a weekly basis, under intensive supervision and evaluation of a departmental faculty member, which in most cases is the student's academic advisor.

TS494 IRP (Integrated Research Program) **0:6:3(6)**

This course (3 credits) is designed for performing separated project of real problems in the related theoretical courses. The contents are not preset experiment but reconstructed and performed by student in one of real issues through one semester.

TS495 Independent Study **0:6:1(6)**

Students in this course conduct individual or group projects focused on research, literature review, implementation or extension/enhancement of other coursework. All work is conducted, on a weekly basis, under intensive supervision and evaluation of a departmental faculty member, which in most cases is the student's advisor.