

## Overview of Research Ethics Education Framework (implemented in AY 2019)

Note: Each School, Department, and educational program is responsible for determining teaching methods required for research ethics education starting in April 2019. Students may take courses/programs from among those listed in the “Learning methods” section in line with their individual study plan.

|  |   | 1. Academic integrity  | 2. Roles and social responsibilities of researchers  | 3. Responsible Conduct of Research (RCR)   | 4. Compliance with laws and ordinances   |
|--|---|--|--|--|--|
| Main objectives                          |   | Understand and promote academic integrity <ul style="list-style-type: none"> <li>• Conform to standards expected of Tokyo Tech students</li> <li>• Adhere to ethical practices while conducting research</li> <li>• Understand and share the vision and values of the Code of Conduct for Researchers at Tokyo Institute of Technology</li> </ul>  | Understand and perform roles and social responsibilities of researchers <ul style="list-style-type: none"> <li>• Recognize that researchers are responsible citizens contributing to society</li> <li>• Understand recent ethical issues in research and academia</li> <li>• Understand the impact science and technology have on the environment and society</li> </ul> | Understand and adhere to the principles and values of RCR <ul style="list-style-type: none"> <li>• Understand freedom and obligations in conducting research</li> <li>• Handle data correctly</li> <li>• Understand the concept of authorship</li> </ul> | Be knowledgeable about and compliant with regulations and policies related to RCR such as: <ul style="list-style-type: none"> <li>• regulations and policies set forth by the government or Tokyo Tech in regard to research</li> <li>• rules regarding research misconduct</li> <li>• research fund guidelines</li> </ul> |
| Educational target                       | Level 3:<br>Doctoral-level study  | Students must further deepen their understanding of ethical principles common to various academic disciplines, as well as ethical issues associated with their field of study. They are expected to provide guidance and assist in building a sound research environment.  |  |  |  |
|  | Level 2:<br>After starting Independent Research Project until completing master’s-level study | Students must have a deep understanding of ethical principles common to various academic disciplines. They are expected to improve their understanding of ethical issues associated with their field of study while conducting research.<br>Examples include knowledge regarding: safety management in research environments; informed consent; personal data protection; keeping laboratory notebooks and correct data handling; maintaining confidentiality; authorship; prohibition of duplicate submission/publication; copyright protection; appropriate use of research funds  |  |  |  |
|  | Level 1:<br>Before starting Independent Research Project                                      | Students must have a basic understanding of ethical principles common to various academic disciplines when starting full-fledged research. In addition, they are expected to understand the fundamentals of ethical issues associated with their field of study.<br>Examples include knowledge regarding: academic integrity (understand what constitutes academic dishonesty, including cheating, submitting the same paper for two different classes, and copying someone else’s work and using it as one’s own); ethical decision-making methods (e.g., the Seven-Step Guide); the impact science and technology have on society; case studies on ethical issues; how to write scientific reports; rules for citing sources; the purpose of keeping laboratory notebooks and how to maintain them; correct ways of collecting, managing, and processing data*; specific research misconduct (acts of misconduct specified by MEXT, i.e., fabrication, falsification, and plagiarism); relevant regulations or policies<br>* All types of information based on facts, used for rational deduction (as defined in “For the Sound Development of Science” published by JSPS) |  |  |  |
| Learning methods (courses and resources) |   | 【Courses】 Students are required to take courses with “ethics” in the title, or other courses that include the topic of research ethics. Details will be explained in the course syllabus.<br>【Workshops, guidance, etc.】 Freshman orientations; guidance or workshops on research ethics<br>【Online courses】 eAPRIN Tokyo Tech basic courses (e-learning) (20–30 minutes per unit, 6 hours in total), eAPRIN JST courses for scientists and engineers (e-learning) (20–30 minutes per unit, 5 hours in total), MOOC and SPOC (6 hours each), JSPS’s e-Learning Course on Research Ethics (el_CoRE) (90 minutes)<br>【Others】 Research ethics education in laboratory settings; The Lab (visual education material distributed by JST); regulations or guidelines regarding research ethics; Tokyo Tech’s research ethics web pages for current students; find ethical issues at each and every opportunity  |  |  |  |
| Review                                   |   | Students are expected to complete and submit a Checklist corresponding to their level at least once a year.  |  |  |  |

Examples of how students learn research ethics:

Level 1: Bachelor's students complete the Tokyo Tech Visionary Project in the first year, learn about research ethics at orientation sessions offered by Departments in the second year, and complete the Liberal Arts Final Report in the third year. They may also take courses that include the topic of research ethics, or learn by themselves using SPOC.

Level 2: Students participate in discussions at their laboratory. The Lab (visual education material distributed by JST) must be used as the discussion material. Students may also take courses that include the topic of research ethics, or learn by themselves using eAPRIN. First-year master's students will learn about research ethics at orientation sessions for graduate majors.

Level 3: Based on the completion of level 2, students are expected to lead discussions at their laboratory. The Lab (visual education material distributed by JST) must be used as the discussion material. Students are also expected to assist in building a sound research environment.