SHINSHU UNIVERSITY | Faculty of Textile Science and Technology

Faculty of Textile Science and Technology (FTST) Shinshu University

Guide 2020-2021

FIBER INNOVATION

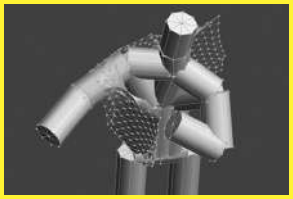
New science and technology wait for you to be discovered.

We aim for advances of science and technology in harmony with the environment to maintain and improve our healthy and cultural life.

To date, conventional technologies have pursued their efficiency and speed. However, novel technologies should be not for technologies themselves but should be based on science in harmony with the environment. This concept is the most important to create the novel science and technology in the future, beyond the borders among nations, races and generations. The prosperous future begins here in the Faculty of Textile Science and Technology (FTST), Shinshu University.

The Faculty has a long history of leading and outstanding for textile science and technology in Japan since the foundation of its predecessor, the Ueda Imperial College of Sericulture and Silk Industry in 1910

Nagano prefecture has been historically known as powerhouse of two industries; textile and precision machinery, which had been at the core of the modernization of Japan over 150 years. The college was the first national educational institution established in Nagano prefecture focused on silk fiber, which was the leading-edge technology of the time. With the reformation of national university system in1949, the college was reorganized as Shinshu University, the Faculty of Textile Science and Technology (FTST) and since then, we have continuously pursued development of science and technology of textile and the related fields. As one-of-a-kind higher educational institution in Japan, FTST has been the place of new discovery and we continually seek for playing the leading role in the rapidly changing global society.



Toward the creation of novel values beyond the domain boundaries

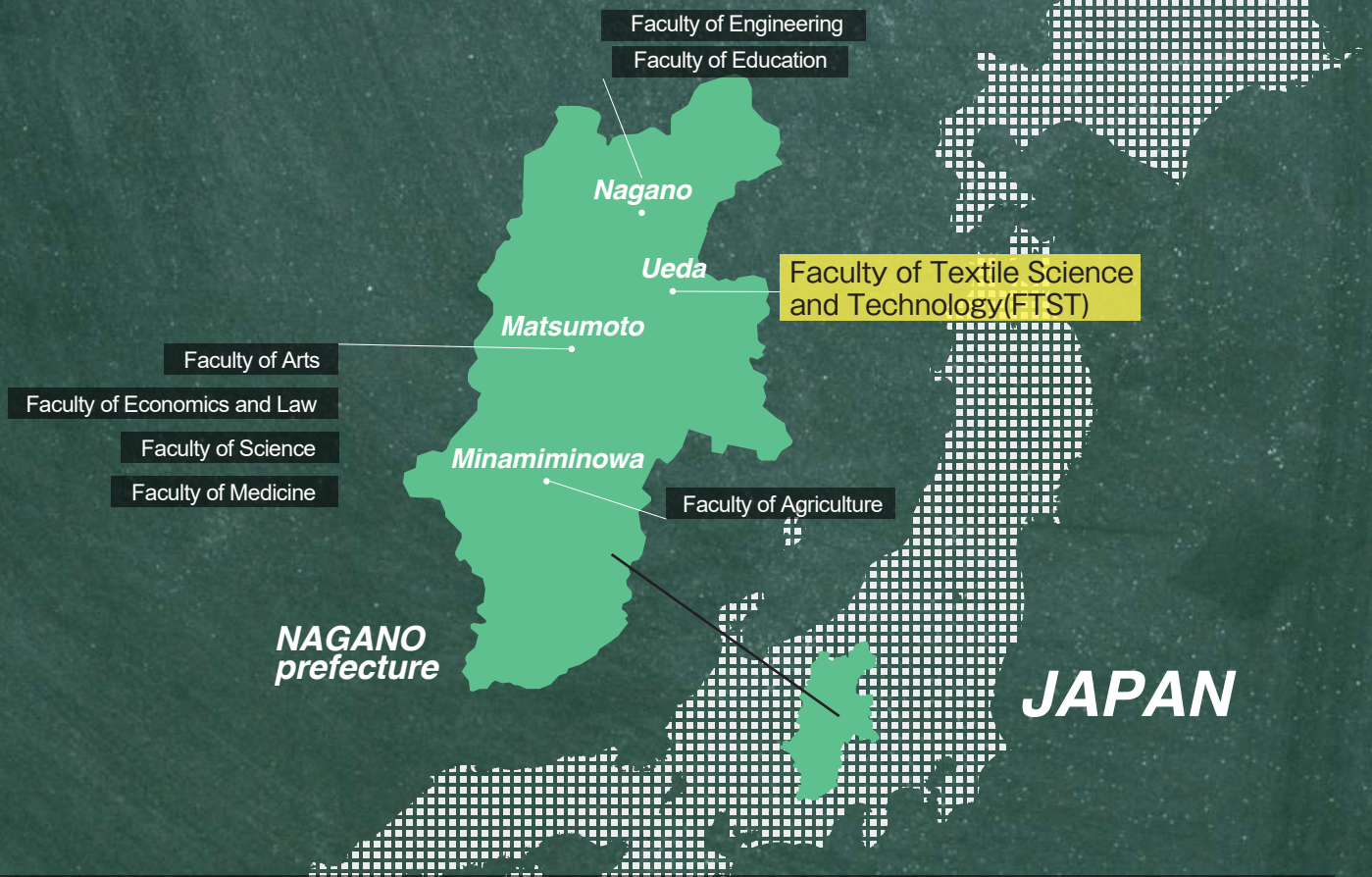
FTST crosses numerous domain boundaries among science, engineering, agriculture and medicine, to take on the challenge of creating novel values from new viewpoints.

The state-of-the-art facilities inspire to create cutting edge researches

Our numerous advanced facilities encourage researchers working on a number of pioneering projects. In the FTST's excellent environment, researchers can be inspired to make a challenge and achieve their exciting dreams.

OUTLINE

In the Edo period (1603-1867), Shinshu State was one of the best areas of silk production. After Meiji Restoration in 1868, this state was changed its name into Nagano prefecture, which had yet maintained the leading position of silk industry in Japan. Accordingly, in Meiji era of 43 (1910), the Ueda Imperial College of Sericulture and Silk Industry was founded for the first time in Ueda City, Nagano. In Showa era of 24 (1949), the college was transformed into Faculty of Textile Science and Technology (FTST) as one of the faculties in Shinshu University. Today, the FTST is the only faculty of textile in Japan.



Shinshu University was established in 1949 by combining seven higher educational institutes which had been founded in Nagano prefecture, and reorganized into an independent administrative agency of national university in 2004. Shinshu University is consisted of eight undergraduate faculties and corresponding graduate schools containing doctoral programs (see the tables on top in the next page). Shinshu University is engaged in education, research, community contribution and international exchange activities based on the following principles:

Principle 1 | Shinshu University values the rich, natural environment of Shinshu and its history, culture, and the work of its people.

Principle 2 | Shinshu University strives to conserve nature, improve the welfare of all people, and cultivate industry through intellectual properties and activities.

Principle 3 | Shinshu University is a place where the intersection of diverse cultures and ideas fosters young individuals to understand and accept these diverse elements and live in harmony.

Principle 4 | Shinshu University values the independence of its students, faculty and staff.

Principle 5 | Shinshu University utilizes our skills and accomplishments not to harm, but to benefit all people.

Overview of Shinshu University

Faculty Organizations

	Students	Teachers	Administrative Staff
Faculty of Arts	730	34	9
Faculty of Education	1044	75	27
Faculty of Economics and Law	849	37	10
Faculty of Science	876	62	14
Faculty of Medicine	1,361	180	36
Faculty of Engineering	2,147	112	46
Faculty of Agriculture	735	59	26
Faculty of Textile Science and Technology	1,247	70	42
Total	**8,989**	**629**	**210**

Graduate School Organizations

		Students
Division of Arts	Master's program	9
Graduate School of Education	Master's program	55
Division of Industrial and Social Studies	Master's program	39
Graduate School of Science and Technology	Master's program	1,269
Graduate School of Medicine	Master's program	57
	Doctoral program	136
Graduate School of Medicine, Science and Technology	Doctoral program	213
Total		**1,778**

Number and Nationality of International Students

China	156	Italy	4	Botswana	1
Vietnam	59	Sri Lanka	4	El Salvador	1
South Korea	55	Belgium	2	Ethiopia	1
Malaysia	16	Egypt	2	India	1
Thailand	13	Iran	2	Jordan	1
Mongolia	9	Mexico	2	Moldova	1
United States	8	Morocco	2	Netherlands	1
Bangladesh	6	Myanmar	2	Palestine	1
France	6	Nepal	2	Paraguay	1
Pakistan	6	Poland	2	Philippines	1
Taiwan	6	Russia	2	Saudi Arabia	1
Indonesia	5	Australia	1	Spain	1
Brazil	4	Belarus	1	Uzbekistan	1
Germany	4	Benin	1	**Total**	**395**

As of May 2019

Why was the Faculty of Textile Science and Technology founded in Ueda City, Nagano Prefecture?

It is strongly related to the history of Japan more than 150 years ago since around the end of the Edo period just before the Meiji Restoration (1868). Since 1854, the Edo Shogunate had opened trade treaties with the Western powers one after another. Kozukenosuke Oguri, an elite bureaucrat of the Shogunate, visited the United States in 1860 and realized that steelworks and shipyards were indispensable for modernization of Japan. After his returning to Japan, Oguri decided to build shipyards together with steelworks in Yokosuka from introducing the French technology, but the cost of the constructions was enormous. In order to cover this tremendous cost, he decided to monopolize the Japanese raw silk by the Shogunate and export to France. At that time, the silk industry was a major industry in France, but it was devastatingly affected by the epidemic of silkworms. Accordingly, they were eager to import the Japanese raw silk to recover the French silk industry. Thus, the first steel shipyard began to construct in Yokosuka. The Meiji Restoration government took over this project from the Edo Shogunate, and the Yokosuka Shipyard was completed in Meiji era of 4 (1871). That was the first milestone in the Japanese modernization. The tremendous cost of modernization was covered by the raw silk production and export from the end of the Edo period to the beginning of the Showa era (1926-1989). About half of the Japanese silkworm-egg cards and raw silk threads were produced in Johshu (the present Gunma prefecture) and Shinshu (the present Nagano prefecture). This is the reason why Tomioka Silk Mill, now a World Heritage Site, was built in Johshu, and the Ueda Imperial College of Sericulture and Silk Industry was founded in Shinshu.

Brief History of the Faculty of Textile Science and Technology, Shinshu University

In 1910, “the Ueda Imperial College of Sericulture and Silk Industry (Ueda Sanshi Senmon Gakko)” was founded as one of the former Imperial Colleges. Although most of the present Japanese people have misunderstood, the pre-World War II Senmon Gakko is completely different from post-war Senmon Gakko (= vocational school) and Kohtoh Senmon Gakko (= high school + junior college). The pre-war Senmon Gakko was classified in a position of the Tanka Daigaku (=college). The Meiji government imitated the French higher education system consisting of Universités and Grands Ecoles. The Universités correspond to universities such as the University of Tokyo and Kyoto University. On the other hand, Grands Ecoles correspond to the colleges specialized in engineering, civil engineering, chemistry, education, politics and so on. These Grands Ecoles were founded by Napoleon in France. In Japan, the Tokyo Higher Technical School (the present Tokyo Institute of Technology), Tokyo School of Foreign Languages (the present Tokyo University of Foreign Studies), the Ueda Imperial College of Sericulture and Silk Industry (the present Faculty of Textile Science and Technology, Shinshu University) and so on were established as the Japanese Grands Ecoles, according to the clause No. 66 of the "Government Schools under the direct control of the Ministry of Education" dated on March 26, Meiji 43 (1910). Thus, “the Ueda Imperial College of Sericulture and Silk Industry” was one of the pre-war Imperial Colleges.

After the end of the World War II in 1945, the Ueda Imperial College of Sericulture and Silk Industry was combined with the other seven higher education institutions individually existing in Shinshu District (= Nagano Prefecture) and reorganized to Shinshu University as a national university in 1949. The Faculty of Textile Science and Technology (FTST) conducts research and education on a multidisciplinary basis covering science, engineering, agriculture, and medicine. Currently, the FTST is only one faculty for textile science and technology in Japan, and keeps a very unique position in the world. We actively exchange the domestic and international students to produce many world-leading excellent researchers and accumulate novel scientific knowledges.

Number of Students at FTST

Program	Number	Exchange Students (included)
Bachelor	1,247	21
Master's	413	22
Doctoral	78	34
Total	**1,738**	**77**

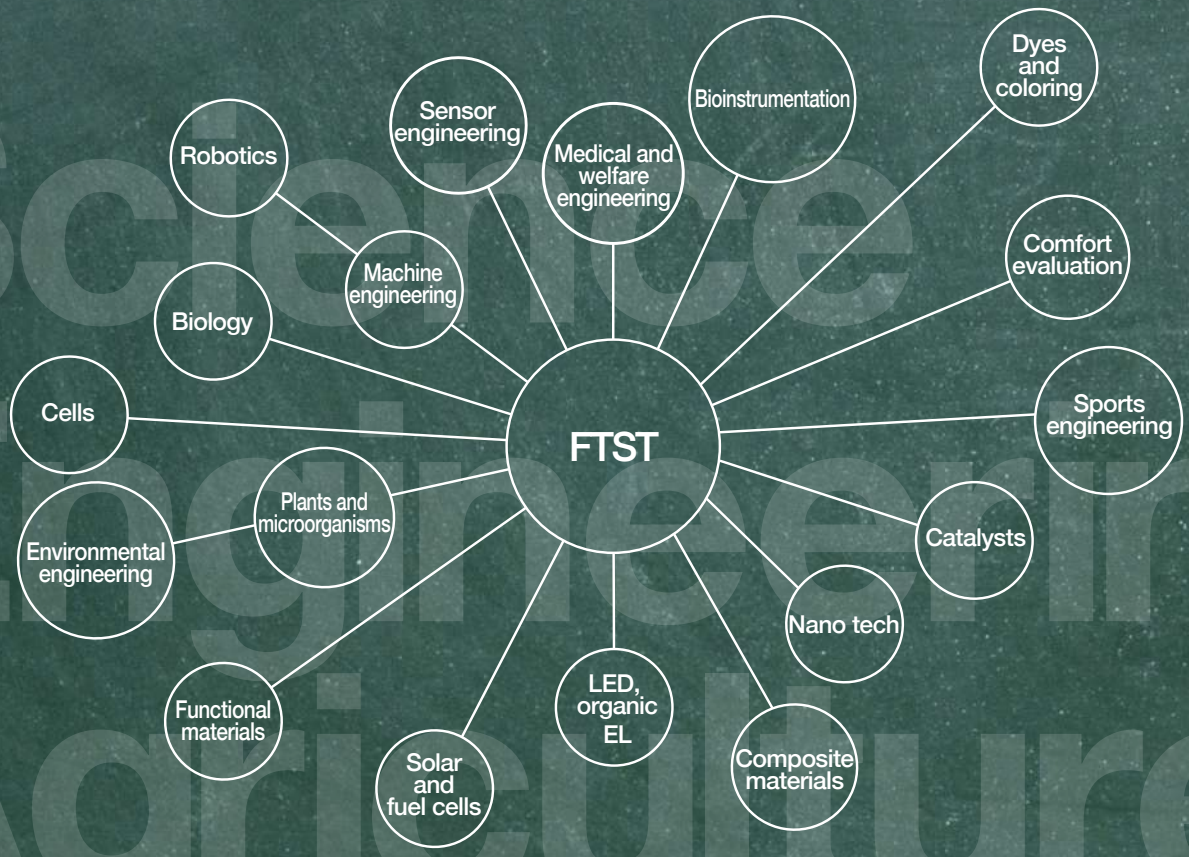
Number of Teaching Staff FTST

	Professor	Associate professor	Lecturer	Assistant professor	**Total**
Number	46	35	1	9	**112**

As of December, 2019

EDUCATION

Our original educational system and integration of interdisciplinary fields cultivate novel viewpoints.



The mission of FTST is to help build a sustainable society where human endeavors and the global environment can exist in harmony. Our curriculum cultivates basic academic skills to respond flexibly to a fluid society with advanced knowledge of science and technology, international awareness and information literacy. The undergraduate program is composed of four departments incorporating various fields of study such as chemistry, physics and biology. We also emphasize practical English skills benchmarked by TOEIC® (Test of English for International Communication). In our interdisciplinary academic environment, future researchers, high-level professionals and engineers can foster their creativity and foresight.

Education System

Faculty of Textile Science and Technology Undergraduate Program (4 years)

Deapartment	Course
Advanced Textile and Kansei Engineering (65)	Advanced Textile Engineering
	Kansei Engineering
Mechanical Engineering and Robotics (60)	Functional Machinery and Mechanics
	Bioengineering
Chemistry and Materials (105)	
Applied Biology (50)	

Graduate School of Science and Technology Master's program (2 years)

Department	Division
Textile Science and Technology (160)	Advanced Textile and Kansei Engineering
	Mechanical Engineering and Robotics
	Chemistry and Materials
	Applied Biology
Biomedical Engineering (35)	Biomedical Engineering

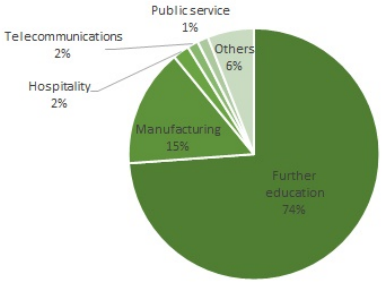
Graduate School of Medicine, Science and Technology Doctoral program (3 years)

Department	Division
Science and Technology (38)	Textile Technology
	Materials Science and Engineering
Biomedical Engineering (15)	Biomedical Engineering

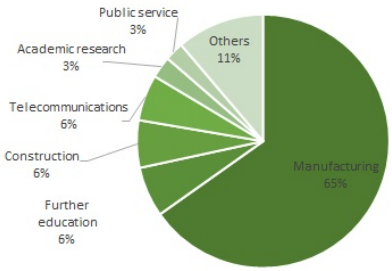
Numbers in parentheses () are the quota of students

Post-graduation Career Paths (Class of 2018)

Undergraduate

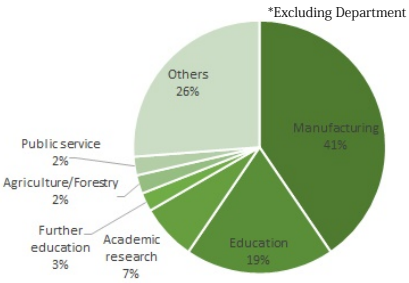


Master's (Graduate School of Science and Technology)



Doctoral (Graduate School of Medial, Science and Technology)

*Excluding Department of Medical Sciences



As of May 2019

Undergraduate Education

Numbers in parentheses () are the quota of students

Department of

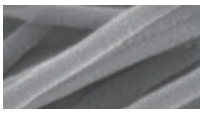
☐ Advanced Textile and Kansei Engineering (65)

We cultivate excellent researchers and engineers who will be able to create new values and cutting edge products through our original abundant educational programs.

Toward the world of new textiles

Advanced Textile Engineering

Our students learn science and technology of the fiber material developments covering everything for clothing, apparel, fashion, sports and interior products.



Generating new values that leverage human creativity *(kansei)*

Kansei Engineering

Our students learn how to create joy, satisfaction and harmony through scientific and technological studies of human creativity(*kansei*) and ethetics.

Department of

☐ Machinery and Robotics (60)

We cultivate excellent researchers and engineers through a wide range of our educational program and researches for mechanical engineering and robotics.

Creating machines which exceed human performance

Functional Machinery and Mechanics

Not only traditional mechanical engineering, but our students learn a wide range of academic subjects, including electronics, information, materials, and nano technology in order to become excellent researchers and engineers.

Creating new bio-designs

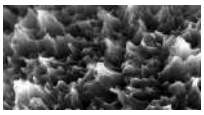
Bioengineering

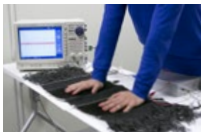
We carry out education and research in new areas that combine biology with engineering, including bio-robotics, bio-mechanics, and bio-mechatoronics.

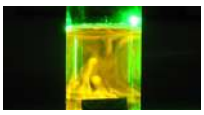
Department of

☐ Chemistry and Materials (105)

We cultivate excellent researchers and engineers who are able to tackle the challenges of cutting edge materials, energy, and environmental issues in the areas of chemistry and materials.



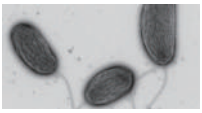




Department of

☐ Applied Biology (50)

We teach basic biological sciences and technologies to cultivate excellent researchers and engineers who will be active in food and pharmaceutical industries.



Graduate School Education (Master's Programs)

Numbers in parentheses () are the quota of students

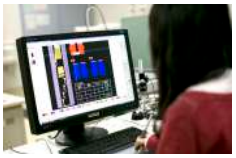
☐ Graduate School of Science and Technology

The Graduate School of Science and Technology is founded as a master's program on three undergraduate faculties: Faculty of Textile Science and Technology in Ueda Campus, Faculty of Engineering in Nagano Engineering Campus and Faculty of Science in Matsumoto Campus. This graduate school provides a master's degree program for two-year term. The master's program at Ueda Campus is divided into two departments: Department of Textile Science and Technology and Department of Biomedical Engineering. Each department cultivates excellent researchers and engineers who will be able to create new science and technology through the advanced education and research beyond a background of traditional science and technology of "fibers".

Department of Textile Science and Technology (160)

Advanced Textile and Kansei Engineering Division

We provide education focusing on advanced fiber engineerings, which systematizes the manufacturing methods of advanced functional fibers, yarns and fabrics, including the measurement and evaluation methods of these productions. Our goal is to foster advanced researchers and engineers who can plan and execute projects from global perspectives with interdisciplinary approaches.



Mechanical Engineering and Robotics Division

The uniqueness of our curriculum is that we study engineering with biological approach. We research functions and structures of living things in order to create machines with human-like senses and even ones with functionally exceeding human capabilities.

Chemistry and Materials Division

This division is comprised of three units: Fiber Materials Engineering Unit, Functional Polymer Science Unit and Applied Molecular Chemistry Unit. Fiber Materials Engineering Unit focuses on materials, systems and process development. Functional Polymer Science Unit focuses on the design of functional materials related to polymers. Applied Molecular Chemistry Unit focuses on studies in chemistry covering everything from the basics to applications of substances.

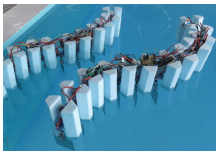
Applied Biology Division

We approach biology to make proactive use of amazing functions of living things. Our educational and research topics are diverse in the use of biomaterials, microbes, animals and insects with the environment conservation in mind.

Department of Biomedical Engineering (35)

Biomedical Engineering Division

In this division, we aim to cultivate excellent researchers and engineers in the field of medical robotics, biological devices, and biomaterials. This new field is based on a wide range of subjects such as biology, physiology, physics, textile engineering, medical ethics, and social medicine.



Graduate School Education (Doctoral Program)

Numbers in parentheses () are the quota of students

☐ Graduate School of Medicine, Science and Technology

The Graduation School of Medicine, Science and Technology was established on five departments of master's program: Department of Science in Matsumoto Campus, Department of Engineering in Nagano Engineering Campus, Department of Textile Science and Technology in Ueda Campus, Department of Agriculture in Ina Campus, and Department of Biomedical Engineering in all the campus. This graduate school provides a doctoral degree program for three- or four-year term.

Department of Science and Technology (38)

Textile Technology Division

This program is comprised of five units: Biofiber Technology Unit, Frontier Fiber Technology Unit, Smart Materials Science and Technology Unit, Kansei and Fashion Engineering Unit.

Materials Science and Engineering Division

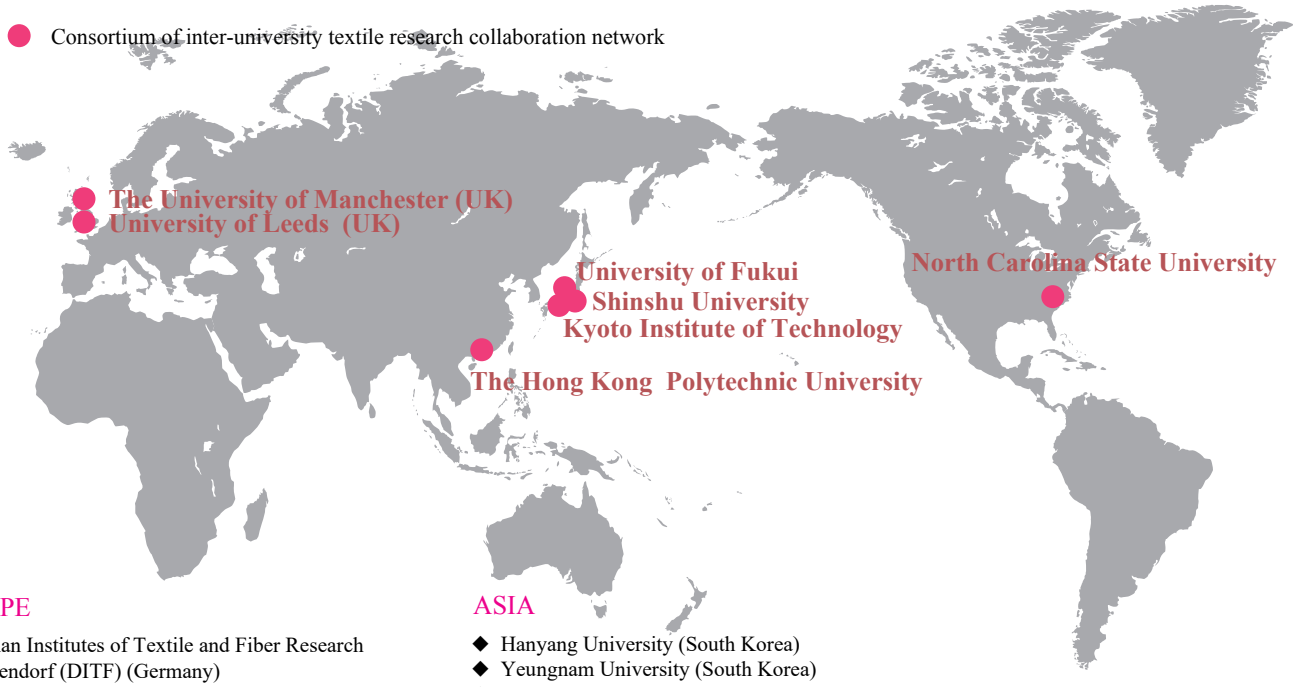
This program is comprised of four units: Functional Molecules and Materials Unit, Matter and Spacetime Science Unit, High Performance Materials Unit, Fundamental Molecular Fundamental Molecular Science Unit.

Department of Biomedical Engineering (15)

Biomedical Engineering Division

This program conducts studies in a novel research fields such as integrated science, technology and medical science. We correlate and apply the fundamental knowledge of medical science, biology, and physiology to the development of medical robots, biological devices, and biological materials for medical care and welfare.

International Network of Textile (Fiber) Engineering



EUROPE

- German Institutes of Textile and Fiber Research Denkendorf (DITF) (Germany)
- Mannheim University of Applied Sciences (Germany)
- Dresden University of Technology (Germany)
- RWTH Aachen University (Germany)
- École Nationale Superieure des Arts et Industries Textiles (ENSAIT) (France)
- l'Ecole Nationale Supérieure d'Ingénieurs Sud Alsace (ENSISA) (France)
- l'Institut Textile et Chimique de Lyon (ITEC)(France)
- University of Natural Resources and Applied Life Sciences (BOKU) (Austria)
- Ghent University (Belgium)
- University of Ljubljana (Slovenia)
- University of Maribor (Slovenia)
- Technical University of Liberec (Czech)
- University of Zagreb (Croatia)
- University of West Attica (Greece)
- Technical University of Denmark
- Aalto Univerisity (Finland)
- University of Boras (Sweden)
- Association of University for Textiles (AUTEX)
- University of Minho (Portugal)

AFRICA

- Ecole Supérieure des Industries du Textile et de l'Habillement (ESITH), (Morocco)

ASIA

- Hanyang University (South Korea)
- Yeungnam University (South Korea)
- Konkuk University (South Korea)
- Soongsil University (South Korea)
- Chonbuk National University (South Korea)
- Chungnam National University (South Korea)
- Kyungpook National University (South Korea)
- Dankook University (South Korea)
- Seoul National University (South Korea)
- Sungkyunkwan University (South Korea)
- INHA University (South Korea)
- Korea Institute of Industrial Technology (South Korea)
- Korea Textile Development Institute (South Korea)
- Korea Dyeing and Finishing Technology Institute (South Korea)
- Soochow University (China)
- Donghua University (China)
- Southwest University (China)
- Zhejiang Sci-Tech University (China)
- Tianjin Polytechnic University (China)
- Chongqing Normal University (China)
- Wuhan Textile University (China)
- Nantong University (China)
- Jiangnan University (China)
- Feng Chia University (Taiwan)
- Chinese Culture University (Taiwan)
- Mongolian University of Science and Technology (Mongolia)
- Kasetstart University (Thailand)
- Chulalongkorn University (Thailand)
- Thai-Nichi Institute of Technology (Thailand)
- Mehran University of Engineering and Technology (Pakistan)
- National Textile University (Pakistan)
- India Institute of Technology Delhi (India)
- Udayana University (Indonesia)
- Brawijaya University (Indonesia)

OCEANIA

- Deakin University (Australia)

NORTH AMERICA

- Cornell University (U.S.A.)

As of June, 2020

FTST promotes world-wide collaboration and exchange of the researchers and students. We have academic exchange agreements with 41 leading universities and 3 institutes overseas in the field of textile science and technology. Especially, we have established a global consortium with the following 6 prominent universities and institutes: The College of Textiles, North Carolina State University (USA); The School of Materials, the University of Manchester (UK); The Institute of Textiles and Clothing, Hong Kong Polytechnic University (China); School of Design, University of Leeds (UK); Faculty of Engineering, University of Fukui (Japan); Graduate School of Science and Technology, Kyoto Institute of Technology (Japan). FTST has contracted a double diploma program agreement with a French Grand Ecole, l'Ecole Nationale Superieure des Arts et Industries Textiles (ENSAIT) for the master level since 2007. In June 2012, FTST joined the Association of Universities for Textiles (AUTEX) as an Associate Member. This association is composed of 39 universities from 30 countries mainly in Europe. Through the international network, FTST globally contributes to further development of textile science and technology.

FIBER INNOVATION | New science and technology wait for you to be discovered.

ENVIRONMENT

Our challenging projects and unique institutes offer you prosperous opportunities in various novel fields.

FTST has constantly been seeking development through numerous projects collaborating with excellent institutes in the campus in order to evolve "fiber science and engineering" for a new era.

The Advanced Leading Graduate Program

Global Leader Program for Fiber Reneissance

Institute for Fiber Engineering

Fiber Innovation Incubator (FII)

Research Center for Supports to Advanced Science (RCSAS)

Asama Rsearch Extension Center (AREC)

Program for Promoting "Inter-University Collaborative Education"

Research Center for Advanced Plant Factory (SU-PLAF)

Primary Projects

☐ The Advanced Leading Graduate Program, "Global Leader Program for Fiber Renaissance"

The purpose of this special graduate school is to nurture global leaders in the field of textile science and technology. The graduate school is served for a straight five-year term of doctoral program combining conventional two-year term of master's and three-year term of doctoral courses. The program is carried out in a collaboration of industry, academia and the national government in order to produce world-class researchers and engineers.

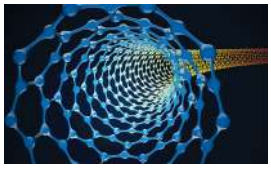
☐ The Japanese Government (MEXT) Program for Promoting "Inter-university Collaborative Education"

Purpose of this program is to unify and exchange the educational and research resources of the textile-related master's course in the graduate schools of three individual universities: Shinshu University, University of Fukui, and Kyoto Institute of Technology. A "Textile/Fiber Engineering course" is established in each of the master's courses in order to cultivate excellent researchers and engineers who will be able to solve problems with global point of views and leadership skills.

Primary Joint Institutes

☐ Institute for Fiber Engineering, Shinshu University (IFES)

On March 1, 2014, IFES was established as the research institute of Shinshu University Interdisciplinary Cluster for Cutting Edge Research, to promote educational research and international collaboration on the fiber-textile-apparel engineering.



☐ Fiber Innovation Incubator (FII)

FII was established in 2011 as a joint research organization for companies, professors, and students. At this institute, the companies can have their individual research laboratories and carry out creative research for their revolutionary new products. Moreover, FII provides students internship opportunities inside the campus.

☐ Research Center for Advanced Plant Factory (SU-PLAF)

This research center was established in 2011 to develop fundamental technologies in plant factories. Our plant factory is an artificial system for production of high-quality vegetable. The cultivation environment (e.g. light, temperature, CO_2 concentration and culture solution) is fully controlled. This research center promotes endeavor in technical guidance, human resource development and accumulation of information for local businesses engaging in plant factory projects.

☐ Asama Research Extension Center (AREC)

This center was established by Ueda city to support collaboration between industry and academia. Here, local industries, the municipal government and Shinshu University collaborate together to promote the joint research in new technologies and reinforce industry-industry collaborations as well as industry-academic collaborations for further development of local industries.

☐ Research Center for Supports to Advanced Science (RCSAS)

RCSAS has four divisions and among them, two divisions --Division of Gene Research and Division of Instrumental Research at Ueda Branch Office -- are located in Ueda Campus. Each division is equipped with numerous analytical instruments and facilities to support researches requiring higher level techniques with safety and efficiency. RCSAS also educate students to obtain analytical skills which are necessary to their researches.

☐ **Division of Instrumental Research**

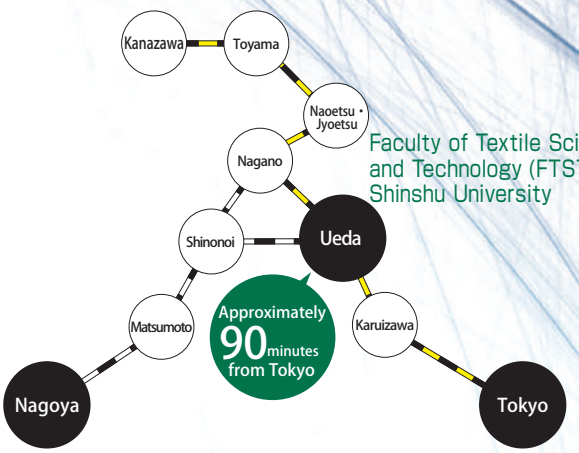
The missions of this division are to maintain these analytical instruments and accelerate the effective utilization of them by the professors, students, and their collaborators.

☐ **Division of Gene Research**

In this division, instruments and facilities for molecular and cellular biological studies are installed. The division is also responsible for education and support of research activities using genetically modified organisms (GMO).

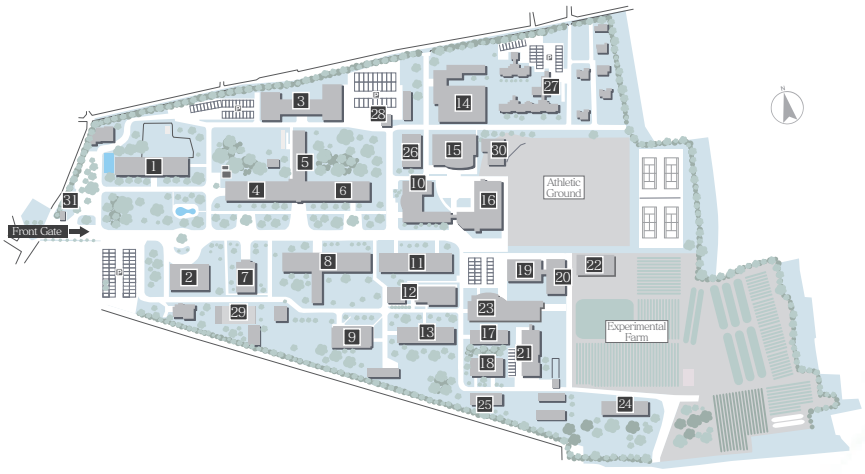
Location of Nagano Prefecture

Access



To Ueda Campus, walk for 20 minutes or ride a taxi for 5 minutes from the Ueda Station.

Campus Map



1 Functional Machinery Mechanics Building
2 FTST Library
3 Textile Training Laboratory
4 Administration Building
5 Lecture Building
6 Textile System Engineering Building
7 Auditorium
8 Chemistry and Materials Building
9 Functional Polymer Science Building
10 Kansei, Engineering and Bioengineering Building
11 Applied Biology Building
12 Advanced Fiber Spinning Facilities
13 Institute for Fiber Engineering, Shinshu University (IFES)
14 Gymnasium
15 Mulberry Hall (Cafeteria/Bookstore)
16 Research Center for Advanced Science and Technology
17 Center for Biotechnology
18 Institute of Experimental Research in Farm
19 Asama Research Extension Center (AREC)
20 Division of Instrumental Research (DIR) Building
21 Genetics Support Division Building
22 Research Center for Advanced Plant Factory (SU-PLAF)
23 Fiber Innovation Incubator (FII)
24 Mechanized Rearing Room for Silkworms Silkworm
25 Rearing Room by Artificial Diet
26 Martial Art Building
27 Student Dormitory
28 FTST Resource Center
29 Archery Court
30 Student Union
31 Security Office

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