Nagoya University (National)
Graduate School of Environmental Studies (GSES)
Graduate School of Engineering (GSE)

◆ **Program name**
Nagoya University Global Environmental Leaders Program (NUGELP)

◆ **Degrees:**
a. Master of Environmental Studies (GSES)
b. Master of Engineering (GSES and GSE)

◆ **Credit and years needed for graduation:**
a. 30 credits, 2 years
b. 30 credits, 2 years

◆ **Program Certificate requirements**
1. 10 credits (out of the 30 above) from the NUGELP curriculum
(See below for curriculum details)
2. Master's thesis and oral presentation in English

◆ **Note**
NUGELP is made up of faculty of the Civil and Environmental Engineering Group.

◆ **Address:**
Furo-cho, Chikusa-ku, Nagoya-shi, Aichi
464-8601, JAPAN

Features of University https://en.nagoya-u.ac.jp

Nagoya University:
Nagoya University is one of the leading national universities located in Nagoya City in Central Japan (Chubu Region). It was established in 1920 first as a medical school and at present has nine undergraduate schools and 13 graduate schools, accommodating about 16,000 students including about 2,600 international students. Among 17 Japanese Novel laureates in the 21st century, six are graduates of or have been affiliated with Nagoya University as faculty members during their career.

Toyoda Auditorium of Nagoya University

City of Nagoya:
Nagoya is the fourth biggest city in Japan in terms of population (over 2 million) and is one of the largest industrial areas in the country. The Nagoya-Chubu Region has been leading Japan's major industries such as automobile manufacturing, represented by Toyota Motor Corporation. The region is also known historically for its past experiences of having overcome industrial pollution and for its furtherance of environmental actions in both private and public sectors.

Features of Graduate School

Graduate School of Environmental Studies https://www.env.nagoya-u.ac.jp/english/
The Graduate School of Environmental Studies was established in 2001 as the first interdisciplinary postgraduate school of environmental studies in Japan by integrating from natural sciences to engineering and social sciences. The school has promoted education and research taking "Sustainability" and "Safety and Stability" as its main visions. These visions are based on a wide range of academic disciplines including engineering, architecture, physical sciences, economics, and politics. These academic disciplines enable us to provide meaningful solutions for the societal demands concerning an environmentally sustainable future for our earth.
Since its establishment, the school has been dedicated to research and education for sustainable development in developing countries. Not only by receiving students from these countries but also by co-working with local researchers and government officials for research and survey projects. The projects cover a variety of issues

ranging from urban and transport planning, low carbon cities, infrastructure management to disaster management.

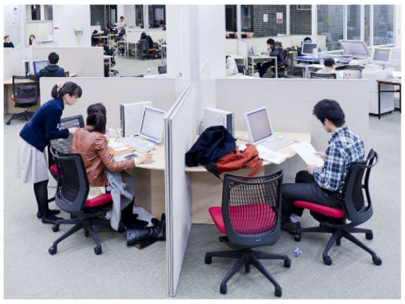
Graduate School of Engineering https://www.engg.nagoya-u.ac.jp/?lang=en

The Graduate School of Engineering aims to foster researchers and engineers with the ability to create and lead the next generation of engineering and technology, as well as high expertise, comprehensiveness, and global perspective.

Among 17 Departments in Graduate School of Engineering, the Department of Civil and Environmental Engineering was established in 1961, after the severe damage by Typhoon Ise-wan. The department focuses on 6 problems to be tackled, i.e. reduction of natural disaster's damage, utilization, conservation and development of resources and energy, preservation and regeneration of existing infrastructure, conservation of natural environment and biodiversity, decarbonized region/city development, and creation of futuristic infrastructure.

Assistance to International Students:

Nagoya University receives about 2,600 international students from more than 100 countries, over 80% of whom are from Asia. The Global Engagement Center (GEC) has abundant experience in supporting international students joining Nagoya University. Moreover, the staff of the Nagoya University Global Environmental Leaders Program (NUGELP) has abundant study and professional experience overseas and is available to assist the program participants. The education and daily communication language under the Program is English. With such a support system at the University, JDS fellows are therefore able to start their study and life without major difficulties.



Features of the Program

Nagoya University Global Environmental Leaders Program (NUGELP)

(https://www.civil.nagoya-u.ac.jp/nugelp/index.html)

NUGELP was established in 2008 to develop environmental leaders who are able to identify and analyze infrastructure and environmental problems from a global and holistic perspective, and propose practical measures to solve the problems in Asia and Africa. The Graduate School of Environmental Studies and the Department of Civil and Environmental Engineering, the Graduate School of Engineering accepts Master's course students and trains them to be leaders.

NUGELP provides solution-oriented education based on the following instructions:

- Students receive comprehensive instructions in English covering various disciplines ranging from civil engineering, transport analysis and planning, sustainability and environmental studies, environmental system analysis and planning, climate change and infrastructure to environmental industry systems.
- Through such instructions, they are able to acquire a deeper understanding of the issues, policies and the relevant technological know-how, and the capacity to design policies and institutions.
- As part of the coursework, students have opportunities to participate in practical research internship at private companies, government bodies or international organizations in the Nagoya-Chubu Region, where a progressive approach to manage environmental problems is ongoing.
- The unique international and interactive nature of the program, in which international and Japanese students learn together, allows students to enhance their understanding of issues from perspectives of local and global viewpoints and improve their international communication skills. Students from China, Bhutan, Philippines, Indonesia, Pakistan, India etc. are studying at NUGELP.
- In addition to the master's degree, a special certificate will be awarded by NUGELP to students who complete the program. It certifies that students have acquired comprehensive capacity and skills to take an active role as a future leader in the field of civil engineering and environmental studies for their home country and the global society.

Special events are also planned for JDS fellows during the two-year degree program.

(i) Domestic and overseas study tours to study planning, design and maintenance management for infrastructure.

(ii) Special lectures from alumni of civil engineering international program in Nagoya University.

Necessary Curriculum to Obtain the Degrees

NUGELP offers all its courses in English within a comprehensive and interdisciplinary curriculum. Master's program students are required to obtain a minimum of 30 credits mainly from the courses listed below as well as to defend their Master's thesis.

Target: Basic Knowledge and Skills as a Leader

- **Sustainability and Environmental Studies (Lecture, 2 credits) by Associated Faculty**
  This course aims to deepen the understanding about "sustainable development", which is one of the central concepts in the environmental studies, through lectures highlighting activities and approaches in various fields. The objective of this course is to acquire the following knowledge and skills. 1) Understand and be able to explain the concept of "Sustainability" in context of environmental studies from three perspectives: a) Society and/or social sciences, b) Observation and analysis by natural sciences, and c) Urban and spatial perspective. 2) Be able to explain "Sustainability" using the concept of "Safety".

- **English Communication in Environmental Issues (Lecture, 2 credits) by Miho IRYO and Sohyun CHUN**
  International communication skills are indispensable to propose policies that address environmental issues in the international communities. This lecture aims to improve international communication skills through analysis, policy proposals and discussions on environmental issues. The objective of this lecture is to acquire the following knowledge and skills. 1) Understand and apply effective presentation and discussion techniques in English. 2) Understand the environmental issues in various countries and the differences in how environmental issues are perceived by different standpoints. 3) Based on opinions from other perspectives, they can explain their points logically and persuade others.

- **Frontier in Civil Engineering (Lecture, 2 credits) by Associated Faculty**
  The aim of the lecture is to comprehensively examine the framework of civil engineering through the introductions of various research topics, projects and so on which the staff of civil engineering have investigated in recent years. After completing this course, students will be able to 1) explain various recent issues in civil engineering fields, and 2) establish a comprehensive perspective in civil engineering.

- **Civil Engineering and Policies for Developing Countries I (Lecture, 2 credits) by Miho IRYO, Hiroto SHIRAKI and Kiichiro HAYASHI**
  The objective of this course is to learn the basic knowledge related to sustainable development, environmental management, and international cooperation in developing countries for infrastructure development.
  [Course topics] 1. Development 2. Development and agriculture 3. Development and industrialization 4. Sustainable development 5. MDGs and SDGs 6. Environment and resource issues in developing countries 7. International environmental management (international treaty, international organization) 8. International cooperation.

- **Civil Engineering and Policies for Developing Countries II (Lecture, 2 credits) by Associated Faculty**
  The objectives of this course are 1) to study the fundamental knowledge on planning, design, construction and maintenance of infrastructure in Japan, as well as developing countries, 2) to survey various issues in civil engineering, including the environmental problems and recent development of regional disaster mitigation activities.
  [Course topics] 1. Disaster risk assessment 2. Water resources and river basin management 3. Coastal zone management 4. Infrastructure development under aid programs 5. Infrastructure projects in developing countries.

Target: Advanced Technologies and Knowledge

- **Environmental Systems Analysis and Planning (Lecture, 2 credits) by Hiroki TANIKAWA**
  Through this course, students will understand "environmental systems" listed as follows. 1) the interaction of human activities and nature, 2) the scientific mechanisms of global environmental problems, such as climate change, 3) the basic principles and methods of analyzing environmental systems, e.g., environmental economics, mathematical models, life-cycle assessment, etc., and 4) the principle and methods of environmental management at local, national and global scales.
  [Course Topics] 1. About Environmental System Analysis 2. Carrying Capacity, Water, Energy, Material

Flow/Stock 3. Simple Global Warming modeling 4. Industrial Symbiosis modeling 5. The basis on Input and Output Analysis 6. Urban Climate Modeling.

- **Transportation Systems Analysis (Lecture, 2 credits) by Tomio MIWA**
  To plan and evaluate efficient and sustainable transportation systems analysis, the objectives of this lecture are to learn transportation surveys, travel demand analysis, and evaluation methods of the systems. It also aims to build capacities of using them in transportation research and practices.
  [Course Topics] 1. Transportation demand and travel survey 2. Aggregate demand model (trip generation & production/attraction, trip distribution, Modal split, Traffic assignment) 3. Disaggregate demand model (binary choice, multinomial choice, estimation and statistical test, aggregation and forecast, multi-dimensional choice, advanced discrete choice models).

- **Advanced Traffic Engineering and Management (Lecture, 2 credits) by Hideki NAKAMURA**
  Goals of the course is to understand fundamental traffic characteristics and be able to estimate variables required for highway planning and traffic operation such as highway capacity and delay, and to understand fundamentals of traffic signal control technique and to be able to set traffic signals.
  [Course Topics] 1. Introduction to Traffic Engineering and Its Scope 2. Traffic Surveys 3. Macroscopic Traffic Characteristics 4. Microscopic Traffic Characteristics 5. Capacity Analysis and Breakdown Phenomena 6. Highway Planning and Level of Service 7. Fundamentals of Traffic Signal Control 8. Capacity of Unsignalized Intersections and Roundabouts.

- **Advanced Course in Lifecycle Design of Civil Structures (Lecture, 2 credits) by Hikaru NAKAMURA, Takeshi HANJI and Koji NISHIGUCHI**
  This course objective is to study design method and maintenance of bridge structures in the context of lifecycle management of civil structures. After completing this course, students will be able to list different types of structural design methods and explain their differences, explain typical design flow of bridge structures, and understand current conditions of existing bridges and describe maintenance systems of bridges in Japan.
  [Course Topics] 1. To study fundamental theory of reliability-based structural design and to understand structural reliability and different design methods such as the allowable stress method and the limit state design method 2. To understand a typical flow of structural design which includes structural planning, selection of structural systems, verification of required performances, lifecycle cost analysis, and maintenance plan, by studying design examples of steel and concrete structures 3. To understand current conditions of existing bridges in Japan and to study efficient maintenance systems of bridge structures.

- **Advanced Infrastructure Planning (Lecture, 2 credits) by Tomio MIWA and Toshiyuki YAMAMOTO**
  The course objective is to understand the meanings and objectives of infrastructure and learn the infrastructure planning methods. The goals of the class are to be able to explain the public economy, and solve the problems to derive the appropriate results by applying the evaluation methods and decision methods considering the uncertainty.
  [Course Topics] 1. Public economics (Social welfare and Pareto optimum, Consumer's behavior and demand curve, Producer's behavior and market equilibrium, Market failure, Externality, Public goods) 2. Introduction to decision making in infrastructure planning 3. Evaluation and decision making (Cost-benefit analysis and value of non-market goods, Evaluation methods of non-market goods and utility function, Value of travel time saving and project evaluation, social welfare function and analytic hierarchy process) 4. Decision making under uncertainty (Expected utility theory, Bayesian decision making and value of information, Game theory and dilemma problem).

- **Advanced Fluvial and Coastal Hydrodynamics (Lecture, 2 credits) by Tomoaki NAKAMURA and Yuji TODA**
  The aim of this course is to understand physical processes in rivers and oceans. This class will provide advanced theories and technologies applied in the management of rivers and coasts.
  [Course Topics] 1. Outline of the course 2. Governing equations for incompressible viscous fluid flow 3. Shallow water equations 4. Flow resistances in open-channel flow 5. Long wave theory 6. Shallow water wave theory 7. Wave-averaged conservation equations.

- **Advanced Geotechnical Engineering (Lecture, 2 credits) by Toshihiro NODA and Kentaro NAKAI**
  This lecture aims to learn how the basic knowledge learned in soil mechanics and geomechanics are applying to actual geoengineering, and to understand its theoretical background. Specifically, the purpose is to learn about settlement and failure (bearing capacity) problems in soft ground, as well as how to deal with

uncertainties in the actual field of geoengineering such as the safety factor method and reliability design.
[Course Topics] 1. Introduction to geotechnical engineering 2. Multi-dimensional consolidation analysis 3. Observational method for predicting consolidation settlement (Asaoka method) 4. Mean effective stress and bearing capacity 5. Undrained bearing capacity (φ_u=0 circular slip surface analysis).

- **Advanced Numerical Analysis (Lecture, 2 credits) by Tomio MIWA and Kentaro NAKAI, Tomoaki NAKAMURA and Koji NISHIGUCHI**
  This lecture provides basic theories of numerical analyzing techniques which are often used in the civil engineering field. The goal is to understand and apply numerical optimization method, finite element method, approximate analysis of ordinary differential equation and finite difference method for computational fluid dynamics simulation through the lecture and practical work.
  [Course Topics] 1. Finite element method 2. Optimization problem 3. Finite difference method 4. Approximate analysis of ordinary differential equation.

- **Advanced Steel Structures (Lecture, 2 credits) by Kazuo TATEISHI**
  Deterioration and its prediction method for steel structures are lectured. The goal of this course is to understand the following issues: Importance of maintenance of infrastructures, Deterioration in steel structures, Calculation method for remaining life of steel members based on fracture mechanics, Fatigue and corrosion in steel members, Inspection method for steel structures.
  [Course Topics] 1. Importance of maintenance and difficulties 2. Experiences of damage in steel structures and repair/retrofitting methods 3. Fatigue and preventing method 4. Linear fracture mechanics and its application 5. Corrosion and preventing method 6. Inspection method for steel structures.

- **Advanced Concrete Structures (Lecture, 2 credits) by Hikaru NAKAMURA and Taito MIURA**
  The objective of this course is to learn advanced knowledge of the design, construction and maintenance of concrete structures, to acquire applied skills that make use of the knowledge in practice. After completing this class, students will be able to: Confirm basic knowledge of RC structures, Understand nonlinear analysis of concrete, Understand time dependent behavior of concrete, Understand construction for quality control.
  [Course Topics] 1. Basic knowledge of design of concrete structures 2. Outline of nonlinear structural analysis for concrete structures 3. Outline of diffusion analysis for concrete structures 4. Volume change and cracking of concrete. 5. Quality control of concrete 6. Proposal of design and construction concepts for quality control.

- **Advanced Mechanics of Geomaterials (Lecture, 2 credits) by Masaki NAKANO**
  The aim of this course is to acquire the basics and applications of geomaterials mechanics for safely constructing and maintaining various geotechnical structures. Concretely, this course introduces the mechanical behavior of remolded clay and natural deposited clay, and the difference between the two. Then, the course also introduces the basics of plastic mechanics, an elasto-plastic constitutive model, and the mechanical behavior of remolded clay and naturally deposited clay based on the constitutive model. In addition, the object is expanded to sand, problematic soil, and improved soil, and their mechanical behavior is also explained based on elasto-plastic mechanics. In addition, in the design of the geotechnical structure, the advantages and disadvantages of each are compared by comparing the current design method and the approach using the elasto-plastic constitutive model.

- **Advanced Urban Planning (Lecture, 2 credits) by Hirokazu KATO**
  In the state of the aging and declining population, global environmental issues and catastrophic natural disasters, you explore desired urban planning and required economic and financial systems to support it. The goals by learning this lecture is as follows: 1) To learn and explain the necessity of urban planning and its basic items and requirements, 2) To understand and explain the contents, problems and reasons for Japanese spatial planning, 3) To understand and explain the direction of spatial planning in Japan and developing countries in the future.

- **Advanced Continuum Mechanics (Lecture, 2 credits) by Masaki NAKANO and Toshihiro NODA**
  The aims of this course are to review the concept of vector/tensor and to understand the basics of continuum mechanics such as kinematics (geometry of motion), equilibrium rules, and objectivity. Students will be able to 1) Understand and explain the basis of Vector and Tensor Analysis, 2) Explain material and spatial descriptions of the physical value of body, material/spatial time derivatives and expression of deformation of body using tensor, 3) Understand and explain properties of Cauchy's stress tensor, 4) Understand and explain law of mechanics and Cauchy's first/second law of motion, and apply them to the interpretation and representation of the mechanical behavior of continuum body.

- **Advanced Structural Mechanics (Lecture, 2 credits) by Junji KATO**
  The objective of this course is to learn the basic knowledge of nonlinear computational mechanics and topology optimization for advanced and numerical structural design.

[Course Topics] 1. Nonlinear computational mechanics based on the finite element method (Newton-Raphson method, Geometric nonlinear structural analysis, Basis of numerical instability problem) 2. Structural optimization (Foundation of mathematics of optimization, Formulation of sensitivity analysis, Topology optimization).

- **Advanced Coastal and Offshore Engineering (Lecture, 2 credits) by Norimi MIZUTANI, Tomoaki NAKAMURA, and Yonghwan CHO**
  The aim of this course is to understand wave dynamics in a coastal zone and wave-structure interactions. Students will be able to 1) understand and explain hydraulic phenomena related to the radiation stress, 2) understand and explain diffraction problems, 3) understand and explain wave dynamics including evanescent waves, 4) understand and explain the dynamic behavior of floating bodies.
  [Course Topics] 1. Radiation stress and wave dynamics in a shallow water 2. Diffraction wave theory (vertical cylinder, axisymmetric structure) 3. Dynamic behaviour of floating bodies 4. Potential and the boundary element method 5. Green function and numerical methods.

- **Advanced Theory of River Basin Management (Lecture, 2 credits) by Yuji TODA**
  This course aims to obtain the comprehensive understanding of the theoretical background and the recent technologies for river and river basin management. The attainment target is to get the fundamental knowledge of river basin managements and to acquire the understanding of new technologies of river engineering and fluvial hydraulics.
  [Course Topics] 1. Outline of river and river basin management 2. Sediment transport 3. Fluvial Hydraulics 4. Eco-Hydraulics

- **Advanced Soil Dynamics (Lecture, 2 credits) by Toshihiro NODA and Kentaro NAKAI**
  In this lecture, students will know the seismic damage example such as liquefaction during the actual earthquake and will learn the basic matters and advanced contents related to the ground dynamics, such as the cyclic response of the ground during the earthquake. By learning this lecture, the goal is to be able to 1) Understand seismic damage caused by recent earthquakes 2) Understand the concept of seismic design 3) Understand the vibration mechanism of the mass / mass system 4) Understand the double reflection theory 5) Understand how to understand dynamic problems of water-soil two-phase system based on mixture theory.

Target: Interdisciplinary Topics

- **Environmental Industry Systems (Lecture, 2 credits) by Hiroki TANIKAWA and Miho IRYO**
  The student will learn the practical skills as a leader in developing infrastructure by learning examples of how to apply the expertise and engineering techniques related to environmental conservation activities and technologies to the real world. Lecturers are invited from companies mainly in the Chubu region, which has an advantage in environmental conservation activities and environmental technologies, for lectures on the latest environmental initiatives in business. 1) Lectures by companies and discussions: Listen to lectures on application examples of environmental conservation activities and environmental technologies from companies and discuss their contents. 2) Group presentations: Based on the contents of the lectures and the contents learned in other subjects, a group discussion will be held on the connection between theory and practice, and the results will be presented.

- **Sustainable City Studies (Lecture, 2 credits) by Hiroki TANIKAWA**
  Students will learn policies, plans, and technological and institutional measures to realize Sustainable Society with the idea of sound material cycle society and decarbonization cities, with a view to integrating climatic change mitigation in urban development.
  [Course Topics] 1. Global climatic system 2. Mechanisms of global warming 3. Climatic change and human history 4. Economy, energy and environment and IPCC AR 5. Industrial Ecology and Circular Economy 6. Human activities and energy in cities 7. Urban forms, land use and energy 8. Material and Energy metabolism in cities 9. Material and Energy metabolism of buildings and districts 10. Sound Material Cycle Society and Circular Economy 11. Metal resource and sustainability 12. Stock-type Society and sustainability.

- **Climate Change and Infrastructure (Lecture, 2 credits) by Miho IRYO**
  This lecture aims to acquire the knowledge about the current status and risks of climate change and international initiatives, and to develop the capacity to consider mitigation and adaptation measures from the perspective of sustainable infrastructure development.
  [Course Topics] 1. Scientific basis of climate change and its impact on social system (Learn about climate change and its impact on social systems based on IPCC reports.) 2. Climate change mitigation and adaptation (Through group work, learn how to analyze the potential regional risks of climate change and propose mitigation and adaptation measures.) 3. International efforts to mitigate and adapt to climate change (Learn the historical background of international climate change measures under the Framework Convention on Climate Change, and deepen your understanding of the international decision-making process.)

- **Environmental Urban Systems (Lecture, 2 credits) by Miho IRYO**
  The aim is to deepen the understanding of the technical and institutional systems required to build an environmental city, mainly from the perspective of city planning and transportation planning.
  [Course Topics] 1. Components of urban environment and their issues 2. Historical review of city structures and location theory 3. Observation and assessment of environmental impact 4. Urban / transportation plan for environmental improvement 5. Consensus building and community development 6. Case studies of environmental improvement measures in various cities

Target: Research-oriented internship

- **Global Research Internship (Research training, 2 credits) by Associated Faculty**
  As part of the Nagoya University Global Environmental Leaders Program, this course aims at providing research and survey opportunities at universities, research institutions, companies, governments in Japan and overseas to acquire the ability to conduct practical and applied research. Internship should be conducted based on close communication with Academic Advisor(s). Students are expected to acquire practical research know-how through On-site Research Training (ORT). Details of the internship such as period and terms of implementation should be decided through consultation with Academic Advisor(s) and experts at host institutions.

List of faculty members capable of guiding JDS Fellows

https://www.civil.nagoya-u.ac.jp/introduction/teacher-e.html

An academic advisor shall be tentatively assigned upon selection. Assignment will be based on the submitted documents, consultation and the interview from the viewpoint of JDS fellows' academic and professional background and research interests. All faculty members listed below are authorized to supervise JDS fellows. For more information, please visit the following website and see the accompanying document.
(http://www.civil.nagoya-u.ac.jp/introduction/teacher-e.html)

Structural Engineering, Materials, and Informatics

Name, Title	Area of Specialization	Research Themes
Junji KATO Prof.	Structural Analysis	Numerical simulation and optimal design for structures, Topology optimization for advanced material design, Finite element method for material/kinematic nonlinearity and dynamics, Innovative design and manufacturing with 3D printer, Reduced order-based data science
Kazuo TATEISHI Prof.	Infrastructure System Design	Steel bridge engineering, Maintenance of steel structures, Fatigue and fracture of steel bridges, Mechanics of steel-concrete composite structures
Hikaru NAKAMURA Prof.	Concrete Materials and Structures	Concrete structure, Seismic design of concrete structure, Maintenance and durability of concrete structure, Nonlinear analysis of concrete structure, Nondestructive test of concrete
Takeshi HANJI Associate Prof.	Infrastructure System Design	Steel structures, Fatigue and fracture of steel structures, Repair and retrofitting technique for cracked steel members, Seismic assessment and rehabilitation of steel bridges, Applications of image technique to infrastructures, Welding
Taito MIURA Associate Prof.	Concrete Materials and Structures	Multi-scale mechanical modelling for cementitious materials, Mesoscale chemo-mechanical analysis for chemical deterioration and fracture of cementitious materials, Expansion cracking mechanism due to ASR/DEF, Reduction mechanism of compressive behaviors of concrete due to cracks with different directionality and dispersibility
Koji NISHIGUCHI Associate Prof.	Steel Structures	Numerical simulation of structural dynamics, nonlinear materials, and fluid-structure interaction problems, High-performance computing

Hydraulics, Hydrology, Coastal, and Ocean Engineering

Name, Title	Area of Specialization	Research Themes
Yuji TODA Prof.	River Engineering	River engineering, Fluvial hydraulics with riparian vegetation, Eco-hydraulics, Numerical modeling of river eco-system
Tomoaki NAKAMURA Associate Prof.	Coastal and Ocean Engineering	Stability of coastal structures and their foundation considering dynamic interaction between waves, structure motion, sediment transport, and seabed response; Tsunami-induced topographic change

Geotechnical Engineering

Name, Title	Area of Specialization	Research Themes
Masaki NAKANO Prof.	Geomaterials and Geotechnical Engineering	Mechanical evaluation and quality certification for natural and artificial soil materials based on soil skeleton structure concept, Interpretation of the soil strengthening methods such as solidification, compaction etc. of various soil materials, Constitution of “sediment circulation system” considering utilization of soil materials at ordinary times as well as disaster periods
Toshihiro NODA Prof.	Geomechanics	Soil-water-air coupled finite deformation analysis of saturated/unsaturated soils taking into consideration inertial forces, Interpretation/development of the countermeasure principles of ground improvements, Seismic response analysis of natural deposited and artificial grounds, Numerical replication of natural deposited grounds
Kentaro NAKAI Associate Prof.	Geo-Disaster Prevention Engineering	Comprehension of dynamic/static behavior of various soils and their elasto-plastic description, Seismic response analysis of groundstructure interaction systems, Influence of stratum irregularity on subsurface seismic damage
Takayuki SAKAI Associate Prof.	Geotechnical Engineering	Investigation of the slaking behavior of mudstone, numerical analysis on improving the seismic performance of existing embankments, and environmentally friendly ground improvement technologies

Transportation, Infrastructure, and Environmental Planning

Name, Title	Area of Specialization	Research Themes
Toshiyuki YAMAMOTO Prof.	Network Systems	Vehicle ownership and use, Travel behavior analysis, Environmentally sustainable transport (EST), Intelligent transport system (ITS), Traffic safety
Hirokazu KATO Prof.	Carbon Free, Safe, and Smart Society (Transport and Environmental Planning, Strategy for Local Transport Systems)	Low carbon & sustainable transport system; Environmental life cycle assessment of social stock; Resilient national & urban design; Region revitalization strategies
Tomio MIWA Prof.	Land, Urban and Mobility Design (Transportation Systems Analysis)	Transportation planning; Travel behavior analysis; Intelligent transport systems; Traffic assignment models and traffic simulators
Miho IRYO Associate Prof.	Land, Urban and Mobility Design (Transportation Engineering)	Traffic flow and safety analysis of vehicles, pedestrians and micromobility; Road design for multimodal transport; Traffic simulation development
Xin ZHANG Lecturer	Carbon Free, Safe, and Smart Society (Transportation Engineering)	Evaluation of junction design and traffic signal control, Road user maneuver modeling, Traffic simulation

Environmental and Environmental System Engineering

Name, Title	Area of Specialization	Research Themes
Kiichiro HAYASHI Prof.	Environmental and Energy Biosystems	Renewable energy, Biodiversity and ecosystem service assessment, Environmental assessment, Environmental policy, International environmental cooperation
Naoko YOSHIDA Prof.	Environmental Microbiology, Microbial Ecological Engineering	Microbial wastewater treatment, Bioremediation of groundwater contaminated with organohalide
Hiroki TANIKAWA Prof.	Environmental System for Stock-type Society (Engineering of Environmental Systems)	Environmental system analysis; Resource and Energy Flow for Sustainable Cities; Material Stock and Flow analysis; Weight of cities overtime with 4d-GIS; Socio economical metabolism; Industrial Ecology
Takashi HIBINO Prof.	Material and Energy Design (Environmental Studies of Materials)	Electricity and hydrogen generation technology, Municipal solid waste treatment, Multifunctional cementitious materials design
Hiroaki SHIRAKAWA Associate Prof.	Environmental System for Stock-type Society (Environmental Economics, Resource Economics)	Analysis for economic and environmental interdependency among countries in the world, Evaluation of efficiency of urban environmental management, Economic evaluation of environmental policy
Nagahisa HIRAYAMA Associate Prof.	Environmental System for Stock-type Society (Environmental and Sanitary Engineering, Environmental Emergency Management)	Disaster prevention & preparedness in water system, Business continuity planning & risk communication for water utility, Redesign for water distribution system, Disaster debris management system
Hiroto SHIRAKI Associate Prof.	Environmental System for Stock-type Society (Energy System)	Energy consumption behavior analysis, Technological and economic assessment of climate change mitigation measures, Power and energy system analysis using mathematical models
Sho-ichi IMAWATSU Associate Prof.	Carbon Free, Safe, and Smart Society (Environmental Studies of Materials)	Transformation technologies for organic substances; Greener synthetic methodologies of artificial materials; Sustainable utilization of materials
Anatoly ZINCHENKO Associate Prof.	Material and Energy Design (Environmental Studies of Materials)	Functional materials from biomass and plastic waste; Environmental pollution cleaning; Nanomaterials and environmental nanotechnologies; Sustainable chemical processes and materials upcycling technologies

Land and Infrastructure Design

Name, Title	Area of Specialization	Research Themes
Takashi TOMITA Prof.	Land and Infrastructure Design	Disaster risk estimation, Disaster risk management methodology, Development of disaster resilient ports, Regional potential development for sustainable and resilient society, Tsunamis, Storm surges
Shinichiro NAKAMURA Associate Prof.	Land and Infrastructure Design	Climate change adaptation in developing country, Land design on river basin, Green infrastructure design
Mutsumi TASHIRO Lecturer	Land and Infrastructure Design	Road design on soft ground, Traffic management, Mobility services

Academic Schedule

▌FIRST YEAR ▐

October

- Admission to the Nagoya University Global Environmental Leaders Program (NUGELP)

- Guidance for new students

October-February (Fall Semester): **First Semester**
- Attend lectures, practices and seminars
- Individual instruction by academic advisor(s)
- NUGELP Study tour and Seminar: Presentation and discussion by students and academic advisors

April-August (Spring Semester): **Second Semester**
- Attend lectures, practices and seminars
- Individual instruction by academic advisor(s)
- NUGELP Study tour: Presentation and discussion by students and academic advisors

September: **Global Research Internship**
- Internship at universities, research institutes, companies and local governments.

▌SECOND YEAR ▌

October-February (Fall Semester): **Third Semester**
- Attend lectures, practices and seminars
- Individual instruction by academic advisor(s)
- NUGELP Study tour and Seminar: Presentation and discussion by students and academic advisors

March: **Interim reporting and discussion toward a Master's thesis**
- NUGELP Workshop: Compile and present an interim report at a program workshop
- Discuss with students and academic advisor(s)

April-August (Spring Semester): **Fourth Semester**
- Attend lectures, practices and seminars
- Individual instruction by academic advisor(s)
- Compile a Master's thesis

June-July: **Submission and defense of the Master's thesis**

September: **Completion of the Master's program**
- Receive a master's degree (Master of Environmental Studies (GSES) or Master of Engineering (GSES, GSE) and program certificate
- Return to home countries to develop one's career as global leaders
- Global alumni networking supported by Nagoya University
- Continued academic and career development support from Nagoya University

Facilities https://en.nagoya-u.ac.jp/academics/campus_life/housing/index.html

Dormitory: JDS fellows will be given priority to be accommodated in the university dormitories for the first one year.

Learning in research groups: Students are provided with individual desks, PCs with internet access, and also access to equipment and systems necessary to develop their own research under the supervision of academic advisors.

Library: The University holds its library of a total of 3.3 million copies for educational and research use and subscribes to some 39,000 titles of online journal. The University Library System provides a large number of desks and learning rooms for students to enhance their learning performance.

Message for Applicants

Nagoya University Center for Global Environmental Leaders: In order to cultivate the specialists on civil engineering and environmental studies who will lead infrastructure and environmental policy and measures in the coming decades, Nagoya University established the Nagoya University Center for Global Environmental Leaders, directed by the Dean of Graduate School of Environmental Studies. The university-wide center supports capacity developments, global alumni networking and continued assistance to alumni as well as the regular operation of NUGELP, in close collaboration with the cooperated graduate schools and the Global Engagement Center.

In NUGELP, two English speaking staffs assist international students. Communication between the NUGELP Office and the students is conducted in English so that international students can smoothly start their study without

difficulties.

Global Engagement Center (GEC): GEC provides various assistance to students from overseas including academic and daily life support, courses of Japanese and other languages and cultural understanding, and cultural exchange programs with local communities.

JDS programs in Nagoya University: Nagoya University has been a host university of JDS Fellows at the Graduate School of Law and the Graduate School of International Development. NUGELP has also accepted JDS Fellows from 2011. The University therefore has abundant experience in operating the program and also to assist JDS Fellows. Also, thanks to other programs by JICA such as the long-term training program, many experts from developing countries are studying at Nagoya University.