

JAPAN

NUSIP2023

Nagoya University Summer Intensive Program

Latest Advanced Technology & Trends in Automobile Engineering

+ Japanese Language



Mitsubishi



Toyota

Image courtesy of Toyota, Mitsubishi

Earn college credits while immersed in another culture and engage your intellectual curiosity with the latest findings in automobile industries in Japan that focus and succeed on a level you never thought possible. Join **NUSIP** for six weeks and experience the full range of Japanese cultural life. Course-related excursions will also provide you with an opportunity to discover amazing Japanese cultural scene that has enticed and entranced observers for generations.

Time schedule:

Application Deadline: February 14, 2023

Course Duration: June 14 to July 20, 2023

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Outline

Courses Offered

1. Seminars on Latest Advanced Technology and Tasks in Automobile Engineering (400 level) (3 credits)
2. Elementary Japanese Language Course (100 level) (3 credits)
(Students with previous Japanese language experience will be offered a more advanced language course.)
3. Automobile industry factory and laboratory visits
4. Cultural excursions

Student Capacity

40 overseas students (including maximum of 5 students from the universities without academic exchange agreements with Nagoya University), and
10 Nagoya University students

Program Fee

- US\$2,500 for students enrolled in the universities having concluded academic exchange agreements with Nagoya University
- US\$2,700 for students enrolled in the universities NOT having concluded academic exchange agreements with Nagoya University

Both fees exclude meal and air-ticket expenses. Accommodations in Nagoya, the Japanese language course, orientation, cultural excursion and social activities are included in the program fees.

(Nagoya University students will have the fee for the Automobile Engineering course waived, but will be charged for cultural excursions and social activities.)

Language

English

General Information

Overview

The 2023 summer program at Nagoya University will provide students with a rare opportunity to connect with and play a role in automobile technology. The program offers academic credits towards students' engineering degrees and beyond the core curriculum, students may further supplement their practical know-how with enrichment as they are exposed to the authentic environment of the automobile factory and research center. A Japanese language course is also offered.

Study with an Advanced Curriculum that Gets Results

- Each lecture invites you to learn in a new context, in new ways, gaining perspectives that shape the way you engage with the automobile world.
- Each lecture is as demanding as it is rewarding, resulting from the commitment of Nagoya University faculty and, in most cases, collaboration with industrial researchers from Toyota, Honda, Nissan, Mitsubishi and so forth.
- Unlike many study opportunities abroad, the NUSIP program is led exclusively by faculty, ensuring the same quality education that students encounter on their own campus.

Accommodations

University dormitory (single room with shared facilities)

Meals

Lunch and dinner are available at the campus cafeteria at a reasonable price.

Visa

Those who need a visa to enter Japan are responsible for getting a temporary visitor (tourist) visa.

Health Insurance

NUSIP requires health insurance coverage for all overseas participants. Japan's National Health Insurance system is available to foreigners with long-term visas for Japan only. Therefore, overseas participants must purchase overseas health insurance prior to arrival in Japan. They are required to show proof of health insurance coverage on the first day of summer program.

Learn from Staff Committed to Excellence

Program Director:

Professor Tatsuya Suzuki,
Vice-Dean, Graduate School of Engineering

Chief Coordinator:

Designated Professor Yasuhiko Sakai,
International Affairs, Global Engagement Center

Instructors (Omnibus):

Researchers or engineers from automobile companies and professors at Nagoya University

Course Overview

1. Latest Advanced Technology and Trends in Automobile Engineering (3 credits)

Class hours: Three 45-minute classes a day

(13:30-14:15, 14:30-15:15, 15:30-16:15).

Three to four days a week. Days are not fixed.

1 The Car Industry, Market Trend, Circumstance and Its Future

Global market trend by region / Industry circumstance / Mobility service / Zero emission vehicles / Future trend of EV / EV & PHEV, *Lecturers: Mr. Kazuaki Iwamoto (Mitsubishi Motors Co.), Mr. Makoto Kamachi (ibid.), Prof. Yukio Ishida (Nagoya Univ.)*

2 Overview of Automotive Development Process

Product planning / Development and testing / Sales and marketing / Business evolution / Mobility services / Ecosystem, *Lecturers: Mr. Reuben Seah (Nissan Motor Co., Ltd.), Prof. Koji Mizuno (Nagoya Univ.)*

3 Observation and Evaluation of Driver's Behavior

Driving behavior signal processing / Data centric approach using BIGDATA / Research topics (Driver identification, Behavior prediction, Driver state prediction), *Lecturers:*

Prof. Kazuya Takeda (Nagoya Univ.), Prof. Alexander Carballo (Gifu Univ.), Prof. Eijiro Takeuchi (Tier IV, Inc.), Prof. Chiyomi Miyajima (Daido Univ.)

4 Car Materials and Processing

Plastic working technology in the automotive industry / Parts development / Manufacturing method / Use of simple and slim equipment / Metal forming / High strength steel / Tailored blanks / Aluminum alloy / CFRP, *Lecturers: Dr. Isao Goto (Toyota Motor Co.), Prof. Nobuki Yukawa (Nagoya Univ.)*

5 Movement and Control of a Car

Introduction to automatic control and control engineering / Basic dynamics of cars / Planning for automated driving / Communication for vehicle control / Cooperative control of car, *Lecturers: Dr. Satoshi Makido (Toyota Central R&D Labs., Inc.), Prof. Toru Asai (Nagoya Univ.)*

6 Safety Engineering for Preventing Accidents

Driving behavior analysis and assistance system design / Steering assistance by risk potential field / Pedestrian behavior modeling / Model predictive control for interactive drive / Intelligent personal mobility / Collision mitigation brake system / Autonomous emergency steering system / Night vision blind spot monitor / Driver status monitor, *Lecturers: Prof. Akira Ito (Nagoya Univ., Formerly researcher at DENSO Co.), Prof. Tatsuya Suzuki (Nagoya Univ.)*

7 Crash Safety

Impact biomechanics / Crashworthiness / Car-to-car crash / Traffic injuries / Safety for pregnant women / Vehicle to pedestrian collision, *Lecturers: Prof. Masahito Hitosugi (Shiga University of Medical Science), Prof. Koji Mizuno (Nagoya Univ.)*

8 Automotive Embedded Computing System (tentative)

Classification of automotive embedded systems / Engine management / Automotive control system / Current status and problems / Basic software for automated driving / Toyota automated driving, *Lecturers: Mr. Kazuhiro Kajio (Toyota Motor Co.), Prof. Hiroaki Takada (Nagoya Univ.)*

9 Wireless Technologies in ITS

Brief history of mobile wireless technologies / Overview of wireless technologies for vehicle / Wireless technologies for autonomous driving / Sensors for safe driving (Radar, LIDAR, Camera) / Vehicle positioning system / ITS+Big data, *Lecturer: Prof. Takaya Yamazato (Nagoya Univ.)*

10 Application of CAE to Vehicle Development

CAE (Computer-aided engineering) / FEM/ BEM / Application

to topology optimization / CAE application to vehicle (Noise and vibration, Crash safety, Strength and reliability, Fluid dynamics, Ride comfort), *Lecturers: Dr. Shinichi Arimoto (Toyota Motor Co.), Prof. Toshiro Matsumoto (Nagoya Univ.)*

11 Energy Saving Technology for Automobiles (tentative)

The latest examples of energy-saving vehicles (Hybrid vehicles, Electric vehicles, Fuel cell vehicles) / Diversification of automotive fuel / Automotive power electronics / Autonomous technology and infrastructure, *Lecturers: Mr. Tatsuo Teratani (Toyota Motor Co.), Prof. Shinji Doki (Nagoya Univ.)*

12 Intelligent Transport System in Japan and Auto-nomous Driving

Nine systems developed / Current systems topics: CASE / National projects / Vehicle centric to human centric / Autonomous driving system / Vision beyond Autonomous level 3 / Social implementation of AD at Nagoya University, *Lecturers: Prof. Nobuyuki Ozaki (Nagoya Univ.), Prof. Yasuhiro Akagi (ibid.)*

13 Fundamentals of Traffic Flow Characteristics

Transportation and traffic engineering / Microscopic and macroscopic analysis / Traffic Flow Analysis / Traffic Congestion and Bottleneck, *Lecturer: Prof. Hideki Nakamura (Nagoya Univ.)*

14 Cars and Roads in Urban Transportation Context

Transportation systems in cities / Environmentally sustainable transport-EST / Mixed traffic flow with autonomous and human-driven vehicles / Car-sharing / Charging electric vehicle and fueling hydrogen fuel cell vehicle, *Lecturer: Prof. Toshiyuki Yamamoto (Nagoya Univ.)*

15 Automobiles in Aging Society

Aging society / Elderly drivers and their traffic accidents / Approach to drive longer and safer / Measurement of driver's mental workload, *Lecturer: Prof. Hirofumi Aoki (Nagoya Univ.)*

Evaluation:

Attendance & participation: 20%

Written reports for seminars (15 reports): 20%

Presentation of group project work: 30%

Report of group project work: 30%

2. Japanese (3 credits)

Class hours: Approximately two hours per day for 6 weeks (total 45 hours)

2.1 Elementary Japanese

This class is designed for students who have little or no knowledge of Japanese. This level aims to acquire the most essential language patterns for everyday life, and be able to express intentions in uncomplicated adult-level Japanese.

2.2 Intermediate Japanese

This class is designed for students who have already learned Japanese to some extent.

2.3 Advanced Japanese

This class is designed for students who can speak Japanese rather fluently.

3. Automobile Industry Factory and Laboratory Visits

- Toyota Motors,
- Toyota Boshoku,
- Suzuki Museum,
- Toyota Commemorative Museum of Industry and Technology,
- National Traffic Safety and Environment Laboratory.



4. Cultural Excursions

Kyoto, Nara and Tokyo

Eligibility

• Applicants **MUST** be enrolled in universities having concluded academic exchange agreements with Nagoya University at the inter-university level or with the Graduate School of Engineering at the inter-school level. However, maximum of 5 students from the universities NOT having concluded academic exchange agreements with Nagoya University may join this program.

• Applicants **MUST** be of senior undergraduate or graduate status during the NUSIP period (including junior undergraduates who are completing their junior program).

• Applicants who are non-native speakers of English must possess a TOEFL score of 550 <CBT =213; iBT=79>, TOEIC score of 730, an IELTS overall band score of 5.5, or the equivalent, and should attach a copy of the official score record to the application. However, those studying full time at a university where the medium of instruction is the English language are exempted from this requirement.

Application Procedures

All applicants are requested to submit their applications through the NUSIP online application system during the application period shown below.

Application Period: January 10, 2023 - February 14, 2023.

Applicants will be asked to upload the following documentation in a PDF format (photograph in a JPEG format); hence, preparation of the relevant materials in advance of the closing dates stipulated below is important.

- Statement of purpose (written in English with minimum 400 words)
- Official transcript of academic records in English
- Health certificate: Students are requested to use the designated NUSIP health certificate form available on the application site.
- (Non-native English Speaker) Supporting documents of English Proficiency (i.e., TOEFL, IELTS, TOEIC)
- Photograph with solid-color background, showing a close-up of the applicant's full head and upper shoulders. Sunglasses / tinted glasses, or headwear should not be worn, unless this is for religious or medical reasons.
- A copy of the passport page which shows the applicant's name, date of birth and nationality, where available.
- Curriculum Vitae (CV)
- Declaration of applicable specific categories.

Application Deadline

Online application deadline is **February 14, 2023**

Enquiry

For any enquiries, please send an e-mail to **nusip@engg.nagoya-u.ac.jp**.

Notification of Results

The results of document screening, as conducted by Nagoya University, will be made available to applicants by **March 14, 2023**.