Theory of Data Analysis and Processing (4.0credits) (データ解析処理論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Electrical Engineering	Electronics	Information and Communication Engineering
	Automotive Engineering		
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester		
Lecturer	Associated Faculty	Associated Faculty	Associated Faculty

●Course Purpose

The purpose of this class is to deepen the understanding of the techniques that are necessary for data acquisition and analysis in experiments, and to obtain practical skills. The signal measurement of voltage / current etc. in the experiment is important for the electrical engineering, electronics, information and communication engineering. Students will be able to 1) understand the principle of the signal measurement method, 2) understand the evaluation method of the error on the signal measurement; and 3) process and analyze the measured data using software (LabVIEW and Scilab).

●Prerequisite Subjects

electromagnetics, electric circuits, electronics circuits, mathematics1 & 2, programming, probability / statistics

●Course Topics

1. Signal measurement
1.1 Measuring instrument definition and specification
1.2 Basics of circuit design
1.3 Voltage measurement, current measurement, resistance measurement
1.4 Error source in measurement
1.5 Configuration of PC-based instrument
1.6 Collection and programming of experiment data
2. Data analysis
2.1 Statistical analysis (error, least-square fitting, basic statistics and test)
2.2 Time series analysis (FT, FFT, WT, transfer function, chaos)
2.3 Correlation analysis (autocorrelation, cross-correlation)
2.4 Spectral analysis (fourier analysis, fourier transform, spectral density function)
2.5 Simulation・Observation Experimental Data Analysis (Basic)
2.6 Simulation / Observation Experimental Data Analysis (Application)

Procedures of online lectures and exercises
The documents of the online lectures and exercises will be uploaded onto the NUCT by the dates shown in the seminar.
Please take these online lectures and exercises, and submit your report by the dates shown in the seminar.
Students are considered to have taken the lectures and exercises by submitting the report.

●Textbook

"Low Level Measurements Handbook (6th Ed.), Keithley" and data analysis prints will be distributed.
"Atarashii Gosa-Ron (in Japanese)" by K. Yoshizawa (Kyoritsu)
"Spectral Analysis (in Japanese)" by M. Hino (Asakura)
"Random Data: Analysis and Measurement Procedures" by J. S. Bendat and A. G. Piersol (John Wiley and Sons)

●Additional Reading

LabView Programming Guide ASCII

●Grade Assessment

Evaluate the target achievement level by comprehensively summarizing the presentation content of the seminar, the degree of understanding of the lecture, and the analysis result report of the exercise. Pass score of 60 points or more with 100 full marks.

Grading by Exercises and Reports.
(enrolled student after 2020.4)
A+:100-95, A:94-85, B:84-75, C:74-65, C-:65-60, F: 59
(enrolled student after 2011.4)
S:100-90, A:89-80, B:79-70, C:69-60, F:59-

●Notes

It is necessary to attend the guidance for the basic courses at the beginning of the semester.

To G30 and NUPACE students who hope to be enrolled in the course "Theory of Data Analysis and Processing"

●Contacting Faculty

Professors will answer the questions.
Contact: Muneaki KURIMOTO, mail(kurimoto(at)nuee.nagoya-u.ac.jp)
It is accepted during lecture time or at the end in face-to-face classes.

Automotive Engineering Seminar 1A (2.0credits) (自動車工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
This seminar deals with the basis of fundamental science and engineering related to automobiles.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students' contribution to the seminar.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

Automotive Engineering Seminar 1B (2.0credits) (自動車工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
This seminar deals with the basis of fundamental science and engineering related to automobiles.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students’ contribution to the seminar.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

Automotive Engineering Seminar 1C (2.0credits) (自動車工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	2 Autumn Semester	2 Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
This seminar deals with the basis of fundamental science and engineering related to automobiles.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students’ contribution to the seminar.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

AutomotiveEngineering Seminar 1D (2.0credits) (自動車工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	2 Spring Semester	2 Spring Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
This seminar deals with the basis of fundamental science and engineering related to automobiles.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students’ contribution to the seminar.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

Advanced Lectures on Automotive Engineering (2.0credits) (自動車工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Yasumasa ITO Professor	

●Course Purpose

In this course, students will learn about recent advances in automotive engineering.

Course objectives include the following.
(1) Developing understandings of automated driving systems and improvement of internal combustion engines
(2) Reviewing revolutionary enabling technologies for direct injection gasoline engines and other combustion system engines

●Prerequisite Subjects

Thermodynamics and Fluid Mechanics are preferable, but not prerequisite.

●Course Topics

1. Introduction of Automated Driving Systems
1.1. Overview and History of Automated Driving Systems
1.2. Technologies and Examples of Automated Driving Systems
1.3. Challenges in Automated Driving Systems

2. Evaluation of Vehicle Propulsion Systems
2.1. Codes and Regulations for Automobiles
2.2. Trends in Evaluation Methods of Automobiles
2.3. Life Cycle Assessment for Vehicle Propulsion Systems

3. Improvement of Internal Combustion Engines
3.1. Improving Methods of Thermal Efficiency
3.2. Introduction of Direct Injection Gasoline/Gas Engines
3.3. Perspectives on Various Types of Combustion Systems

No preparation is required.

●Textbook

Printed handouts will be provided.

●Additional Reading

Not required but the book below is recommendable.
Internal Combustion Engine Fundamentals, 2nd Edition 2018, McGraw-Hill, John B Heywood

●Grade Assessment

Grades will be based on class participation and reports.

30% for attendance
30% for interim report
40% for final report

The total score above equal to or higher than 60% out of 100% will pass.

●Notes

No requirements for taking this class.

●Contacting Faculty

Students can ask questions to the lecturer at any time during classes.

Electric Power and Energy Engineering (2.0credits) (電気エネルギー工学特論)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Automotive Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Naoki HAYAKAWA Professor	Yasunobu YOKOMIZU Professor	Takeyoshi KATOH Professor
	Hiroki KOJIMA Associate Professor		

●Course Purpose

Fundamentals on electric power and energy engineering will be studied.

Goal:
1. To understand fundamentals on electric circuit theory, electromagnetic theory, electric energy
2. To understand principles and examples on electric power apparatus, electric power transmission system
3. To understand technical problems of motor systems for electric vehicles (EV) and hybrid vehicles (HEV)

●Prerequisite Subjects

Electric Circuits and Engineering, Thermodynamics and Tutorial, Electricity and Magnetism

●Course Topics

1. Fundamentals: electric circuit, electromagnetics, etc.
2. Electric energy: 3-phase ac, rotating magnetic field, etc.
3. Electric power transmission system for inverter-fed motors, etc.
4. Future electric power system with EV and HEV, etc.

Homework (report etc.) is assigned in the lecture.

●Textbook

Distribution of handout

●Additional Reading

Some books will be introduced in the lecture.

●Grade Assessment

By reports, an understanding of fundamentals and technical problems in electric power and energy engineering will be evaluated.
Credits will be awarded to those students who score 60 or more out of 100.

●Notes

The lecture is held in person and/or by e-learning (on demand).
The e-learning method is written in NUCT.
The students ask lecturers by through NUCT "message" system.

●Contacting Faculty

Students are encouraged to ask questions during and after lectures.
Yasunobu Yokomizu: yokomizu(at)nuee.nagoya-u.ac.jp
Hiroki Kojima: kojima(at)nuee.nagoya-u.ac.jp
Naoki Hayakawa: nhayakaw(at)nuee.nagoya-u.ac.jp
Takeyoshi Kato: tkato(at)nuee.nagoya-u.ac.jp

Semiconductor Devices (2.0credits) (半導体デバイス工学特論)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Automotive Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroshi AMANO Professor	Yutaka ONO Professor	Hiroki KONDOH Associate Professor
	Markus PRISTOVSEK Designated Professor		

●Course Purpose

Fundamental properties of semiconductors and physics of electron and photonic devices for micro- and nanoelectronics are studied. A guideline for novel device designs is mastered in this lecture.

●Prerequisite Subjects

Fundamental physics
Thermodynamics
Quantum mechanics
Solid state physics

●Course Topics

Ch.1 Energy Bands and Carrier Concentration in Thermal Equiribrium
Ch.2 Carrier Transport Phenomena
Ch.3 p-n Junction
Ch.4 Bipolar Transistor and Related Devices
Ch.5 MOS Capacitor and MOSFET
Ch.6 Advanced MOSFET and Related Devices
Ch.7 MESFET and Related Devices
Ch.8 Microwave Diodes; Quantum-Effect and Hot-Electron Devices
Ch.9 Light Emitting Diodes and Lasers
Ch.10 Photodetectors and Solar Cells
Ch.11 Crystal Growth and Epitaxy
Ch.12 Film Formation
Ch.13 Lithography and Etching
Ch.14 Impurity Doping
Ch.15 Integrated Devices

Before each class, students should read textbook of each chapter carefully. After the class, exercises done during class should be reviewed.

●Textbook

Semiconductor Devices: Physics and Technology, International Student Version, Third Edition by S.M. Sze and M. K. Lee, Wiley, ISBN: 978-0-470-87367-0

●Additional Reading

Physics of low dimensional semiconductors, J. H. Davis (Springer)
The Physics of Semiconductors, Marius Grundmann (Springer)
Basic Semiconductor Physics, C. Hamaguchi (Springer)

●Grade Assessment

report (100%) or paper test (100%)
S:100-90 points, A:89-80 points, B:79-70 points, C:69-60 points, F:<60 points
Students should understand the physics of semiconductors and devices.

●Notes

●Contacting Faculty

Hiroshi Amano <amano@nuee.nagoya-u.ac.jp>
Yutaka Ohno <yohno@nagoya-u.jp>
Hiroki Kondo <hkondo@nagoya-u.jp>
Markus Pristovsek <pristovsek@imass.nagoya-u.ac.jp>

Advanced Lectures on Communication and Image Processing (2.0credits) (通信・画像信号処理工学特論)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Automotive Engineering	Automotive Engineering	
Starts 1	1 Spring Semester	1 Spring Semester	
Lecturer	Masaaki KATAYAMA Professor	Takaya YAMAZATO Professor	Keita Takahashi Associate Professor

●Course Purpose

In this course, students are to study wireless communication and image processing technologies which are fundamental to automotive engineering.The goal of this course is as follows.- To understand the basic of wireless communication technology and to apply it for the problems in automotive engineering.- To understand the basic of image processing technology and to apply it for the problems in automotive engineering.

●Prerequisite Subjects

Digital Circuit and Exercise, Digital Signal Processing, Programming and Exercise, Information Theory, Wireless Communication System

●Course Topics

- Basics of wireless LAN- Experimental practice on wireless LAN - Basics of image signal processing- Programming exercises on image signal processingStudents are expected to study the specified material in advance to the class.Students are also expected to complete the exercises before the next class.

●Textbook

Books and papers will be introduced during the classes when necessary.

●Additional Reading

Books and papers will be introduced during the classes when necessary.

●Grade Assessment

The achievement is evaluated by presentations during the classes and reports.

●Notes

No prerequisite.This course will be held every two years (in 2020, 2022, 2024,...).The lectures are provided at the classroom.Please check the further announcement on NUCT lecture site.

●Contacting Faculty

Questions are attended during and after the classes.Use message function on NUCT to ask questions.keita.takahashi<#>nagoya-u.jpReplace <#> with an "at sign".

Advanced Lectures for Information and Computer Sciences (2.0credits) (情報システム工学特論)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Automotive Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Satoshi SATOH Professor	Nobuo KAWAGUCHI Professor	Tetsu IWATA Associate Professor
	Takuro YONEZAWA Associate Professor	KoheiOGAWA Associate Professor	

●Course Purpose

This course covers several topics related to information systems, which includes statistical hypothesis testing, operating system, distributed systems, algorithmic techniques, and information security.
The goals of this course are to
(1) be able to understand and explain the basic functions of operating systems.
(2) be able to understand and explain the concept of distributed systems.
(3) be able to understand and explain the basic algorithmic techniques.
(4) be able to understand and explain information security.
(5) be able to understand and explain the interactive system.

This course is taught in English.

●Prerequisite Subjects

Mathematics and computer science (computer systems, algorithms, and programming languages) in undergraduate course

●Course Topics

1. network protocols, operating system, programming languages
2. distributed systems, synchronized communication, sensor networks
3. algorithmic techniques, search
4. information security, cryptography, data authentication
5. human-computer interaction

You are required to submit a report for each topic.

●Textbook

Printed handouts will be provided.

●Additional Reading

Andrew S. Tanenbaum, Maarten van Steen. Distributed Systems: Principles and Paradigms. (for distributed systems)
Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, and SClifford Stein. Intruduction to Algorithms. Third Edition, MIT Press, 2009. (for algorithmic techniques)

●Grade Assessment

Your final grade will be calculated according to the following process:
Reports 70% and Usual performance score 30%.

●Notes

Programming skills in beginner level (in any programming language) are required.

This lecture may be provided via NUCT, depending on the circumstances of COVID-19.

●Contacting Faculty

Students can ask questions at any time during classes.

Advanced Lectures on Computer-Aided Engineering (2.0credits) (計算機援用工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Toshiro MATSUMOTO Professor	

●Course Purpose

The finite element method (FEM) is widely used in various engineering problems, and the students study the advanced physical modelling of the phenomena, constructing the corresponding mathematical models, advanced computational algorithms of FEM, and how to develop the computer code.
The lecture is based on the handouts and the students are going to cope with the assignments for formulating FEM and example numerical demonstrations.
By finishing this class, the students are targeted to have the capability of doing the following skills:
1. Developing the advanced physical model
2. Developing the advanced mathematical model corresponding to the above derived physical model
3. Formulation of the multi-dimensional finite element method
4. Developing and using a finite element code

●Prerequisite Subjects

Mathematics I, II (Calculus, Linear Algebra), Vector Analysis, Elasticity

●Course Topics

1. Vector, tensor, index notation
2. Formula of integration by parts
3. Cauchy’s formula and stress tensor
4. Balance of force and moment, derivation of equilibrium equation and symmetry of stress tensor
5. Strain tensor
6. Generalized Hooke’s law
7. Navier’s equation
8. Virtual work principle
9. Weighted-residual form and weak form
10. Discretization of weak form and introduction of shape functions
11. Expression of weight-function (virtual displacement) with shape function
12. Derivation of stiffness matrix and equivalent nodal force vector by means of element integration
13. Computation algorithm of finite element method
14. Numerical examples through actual finite element code

Assignments are given regarding the lecture topics.

●Textbook

Handouts are delivered and other documents are put on Web and downloaded.

●Additional Reading

Introduction to Approximate Solution Techniques, Numerical Modeling, and
Finite Element Methods, Marcel Dekker Inc

●Grade Assessment

The understanding of the theory and computation algorithm of FEM is evaluated through assignments and achievement test. Students can pass when the basic formulation of the weak-form of finite element method and its corresponding computational algorithm are understood. The grade is evaluated accordingly when they can formulate the finite element method for more complicated problem and can develop a finite element computer code.

●Notes

- No extra requirements are imposed.
- The classes will be given in face-to-face way and remote way through Zoom.

●Contacting Faculty

Students can ask questions at any time during classes.
Questoins during off-class hours can be asked at the lecturers' rooms:
Room 323, Engineering Building No.2 North Wing 3F, (2780), E-mail: t.matsumoto@nuem.nagoya-u.ac.jp

NUCT messaging and Email can also used for responding to questions.

Industrial Uses of Radiation (2.0credits) (工業における放射線利用)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	ENDO Tomohiro Associate Professor	

●Course Purpose

In this course, students study ionizing radiations, activity, radiation detections, and so on.
Students will also study how ionizing radiations are used as powerful tools in manufacturing industries.
By taking this course, students will gain deep knowledge on the actual conditions and importance of the use of radiation in industry.

●Prerequisite Subjects

This is a general lecture, so no background subjects are specified.

●Course Topics

- Radioactivity and ionizing radiation
- Environmental radiation
- Generation of ionizing radiation, nuclear reactions, accelerators
- Radiography(X-rays, neutrons)
- Radiation detection and measurement
- Utilization of ionizing radiations in manufacturing industries
- Lab tours (Visiting candidates: National Institute on Nuclear Fusion, Accelerator Facility in the Higashiyama Campus, Aichi Synchrotron Center, Hamaoka Nuclear Power Station, etc. Travel expenses will be supported by Nagoya University for G30 students.)

Reports and pre-study assignments will be provided for each class and tour.

●Textbook

Although there are no specific textbooks, materials will be distributed as needed.

●Additional Reading

Although there is no specific reference book, materials will be distributed as needed.

●Grade Assessment

Grades will be assigned based on reports.
If you generally understand the lectures and the contents of the tour,
you will pass this lecture.
If I confirm you can acquire more advanced knowledge,
I reflect it in your grades accordingly.

Grade points
100-95A+
94-80A
79-70B
69-65C
64-60C-
under59F

●Notes

This lecture will not be held, if 2022 if it will be difficult to tour the facility due to the influence of COVID 19.

The first orientation will be also held at ES024 room on April 13th
to briefly explain the plan about this lecture and the situation of lab-tours.
If this lecture can be held, the in-person lecture will be also held at ES024 room before each of lab tour.

●Contacting Faculty

Anytime, contact via e-mail.
e-mailt-endo*energy.nagoya-u.ac.jp

Note: Please replace * with @.

Advanced Experiments and Exercises in Automotive Engineering A (1.0credits) (自動車工学特別実験及び演習A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles through experiments.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
1. Interim presentation and discussions on their own research results.2. Summary and discussions on the literature on their own research topic.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students’ contribution to the experiments.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

Advanced Experiments and Exercises in Automotive Engineering B (1.0credits) (自動車工学特別実験及び演習B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim of this course is to help students acquire deep understanding of the fundamental science and engineering related to automobiles through experiments.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
1. Interim presentation and discussions on their own research results.2. Summary and discussions on the literature on their own research topic.

●Textbook
Textbooks may be provided by the supervisor.

●Additional Reading
Will be introduced in the class as needed.

●Grade Assessment
Grading will be decided based on attendance and the quality of the students’ contribution to the experiments.

●Notes
No requirements for taking this class.

●Contacting Faculty
Students can contact their supervisor.

Latest Advanced Technology and Tasks in Automobile Engineering (3.0credits) (先端自動車工学特論)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester		
Lecturer	Yasuhiko SAKAI Designated Professor		

●Course Purpose

This course is intended to study the latest advanced technology of automobile engineering from top researchers of universities and industries. The topics of lectures are related to almost all fields of automotive industries, such as hibrid cars, electric cars, automated driving and crash safety. It is asle intended to develop the English hearing/speaking ability. The attainment targets are as follows:

1. Understand the latest technology of automotive engineering.
2. Underatand company's automotive production system.
3. Improve English ability in the field of socience and engineering.
4. Strengthen communication skills and presentation skills in English by studying with international students.

●Prerequisite Subjects

lectures related to fundamental physics, mechanical, electrical and information engineering.

●Course Topics

A. Lectures

1. The Car Industry, Market Trend, Circumstance and Its Future.
2. Overview of Automotive Development Process.
3. Observation and Evaluation of Drivers' Behavior Perspective.
4. Car Materials and Processing.
5. Movements and Control of a Car.
6. Safety Engineering for the Prevention of Accidents.
7. Crash Safety.
8. Automobile Embedded Computing System.
9. Wireless Technologies in ITS.

10.Applications of CAE to Vehicle Development.
11.Energy Saving Technology for Automobiles.
12.Automated Driving.
13.Traffic Flow Characteristics.
14.Cars and Roads in Urban Transportation Context.
15.Automobile in Aging Society.
B. Factory Visits
1.Toyota Motors Corp., 2. Mitsubishi Motors Corp., 3. Toyota Boshoku Corp., 4.Suzuki Museum,
5.Toyota Commemorative Museum, 6. Traffic Safety and Environmental Lab.
C. Group Research Project
Several students form one group and each group selects one topic. They investigate and discuss about this topic and make presentations.
After each lecture is finished, read the handout and write a repor about each lecture with your comments.

●Textbook
Handout delivered in each lecture

●Additional Reading
Introduced in the lectures

●Grade Assessment
Evaluation will be based on (a) Discussions in the lectures 20%, (b) report for each lecture 20%, (c) group presentation 30%. and (d) report on research subject 30%. It is necessary to attend factory visits.In each item, the undastanding of the concepts is especially evaluated.
Summing up the all scores from (a) to (d) and the students with evaluation A, B, or C can pass this subject.

●Notes
1. There are limits of enrollment capacity.Full course student limit is about 10.Auditor limit for each lecture is about 10.
2. English ability is checked before accepted as a student.

●Contacting Faculty
The lecturer will answer questions about the content of the lesson, and the instructor in charge will answer other questions.

ysakai@mech.nagoya-u.ac.jp

Introduction to Academic Communication (1.0credits) (コミュニケーション学)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Graduate Chemistry
	Automotive Engineering	Automotive Engineering	Civil and Environmental Engineering Graduate
	Physical Engineering Graduate		
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester		
Lecturer	ReikoFURUYA Associate Professor		

●Course Purpose

Students will learn presentation skills for academic purposes, which may include giving academic presentations.
Japanese students are expected to present in English and international students in Japanese in the seventh or eighth class meeting.
By taking this class, students are expected to be able to do the following:
-Give a solid presentation with confidence and without hesitance
-Grasp the characteristics of successful presentations
-Use techniques learned in class in their own presentation

●Prerequisite Subjects

English language classes for Japanese students
Japanese language classes for international students

●Course Topics

(1) Ways to convey messages in presentation
(2) The language of a presentation
(3) Tips for making effective slides
(4) Observation and analysis of video-taped presentation by a past student
(5) Paper vs presentation
(6) Preparation for individual presentation

(7) Individual presentations I
(8) Individual presentations

This course requires students to work outside of the classes for individual presentation.

●Textbook

Textbooks and references are not assigned for this class. However, depending on the student and class progress, necessary materials will be distributed in class.

●Additional Reading

1The Japan Times
2:

●Grade Assessment

Individual presentation: 50%
Active class participation: 50%

Grades: A+: 100%-95%, A: 94%-80%, B: 79%-70%, C: 69%-65%, C-: 64%-60%, F: 59%-0%

Grading will be decided based on the ability to give an effective academic presentation.

●Notes

There are no requirements for taking this class.
This class will be held face to face unless there are international students who cannot come to Japan.

●Contacting Faculty

Questions will be answered before class, in class, after class or by e-mail.
E-mail address　o47251a@cc.nagoya-u.ac.jp

Research Internship１ U2 (2.0credits) (研究インターンシップ１ U2)

Course Type	Comprehensive engineering courses	
Division at course	Master's Course	
Class Format	Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
Conducting thesis research at different laboratories.U2, U3; short term basic research, U4, U6, U8; long term advanced research

●Textbook
None in particular

●Additional Reading
None in particular

●Grade Assessment
Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

●Notes
No other specific requirements

●Contacting Faculty
Students can contact their supervisor.

Research Internship１ U3 (3.0credits) (研究インターンシップ１ U3)

Course Type	Comprehensive engineering courses	
Division at course	Master's Course	
Class Format	Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
Conducting thesis research at different laboratories.U2, U3; short term basic research, U4, U6, U8; long term advanced research

●Textbook
None in particular

●Additional Reading
None in particular

●Grade Assessment
Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

●Notes
No other specific requirements

●Contacting Faculty
Students can contact their supervisor.

Research Internship１ U4 (4.0credits) (研究インターンシップ１ U4)

Course Type	Comprehensive engineering courses	
Division at course	Master's Course	
Class Format	Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
Conducting thesis research at different laboratories.U2, U3; short term basic research, U4, U6, U8; long term advanced research

●Textbook
None in particular

●Additional Reading
None in particular

●Grade Assessment
Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

●Notes
No other specific requirements

●Contacting Faculty
Students can contact their supervisor.

Research Internship１ U6 (6.0credits) (研究インターンシップ１ U6)

Course Type	Comprehensive engineering courses	
Division at course	Master's Course	
Class Format	Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
Conducting thesis research at different laboratories.U2, U3; short term basic research, U4, U6, U8; long term advanced research

●Textbook
None in particular

●Additional Reading
None in particular

●Grade Assessment
Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

●Notes
No other specific requirements

●Contacting Faculty
Students can contact their supervisor.

Research Internship１ U8 (8.0credits) (研究インターンシップ１ U8)

Course Type	Comprehensive engineering courses	
Division at course	Master's Course	
Class Format	Practice	
Course Name	Automotive Engineering	Automotive Engineering
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Faculty of Automotive Engineering	

●Course Purpose
The aim is to expand the ability as a researcher by conducting thesis research at different laboratories.

●Prerequisite Subjects
All courses in undergraduate course.

●Course Topics
Conducting thesis research at different laboratories. U2, U3; short term basic research, U4, U6, U8; long term advanced research

●Textbook
None in particular

●Additional Reading
None in particular

●Grade Assessment
Credits will be awarded to those students who score 'Pass'. Thesis supervisor will make overall evaluation based on 1) credit hours, 2) research report and 3) evaluation by the host researcher.

●Notes
No other specific requirements

●Contacting Faculty
Students can contact their supervisor.

Advanced Lectures on Scientific English (1.0credits) (科学技術英語特論)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Automotive Engineering
	Automotive Engineering	Civil and Environmental Engineering Graduate	Physical Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
Lecturer	Part-time Faculty		

●Course Purpose

This course aims to help students write a well-structured research paper in English and expand their vocabulary and expression list relating to academic writing.
By the end of the course, students will be able to:
- explain the basic structure of a research paper
- explain the characteristics of each component
- use vocabulary adequately
- use expressions adequately
- choose the most relevant citation style
- write a mini research paper

●Prerequisite Subjects

"English (basic)" and "English (intermediate)" (or equivalent)

●Course Topics

English is the language of instruction in this course.
After reviewing the basics of academic writing, students will understand the fundamental structure of the research paper. Students will improve their vocabulary and expressions to write a well-structured paper as they analyze sample research papers. Additionally, students will understand the citation styles by exploring the descriptions in the instructions for authors in the academic journals of their choice. In the classroom activities, students will exchange ideas, give an oral presentation, practice their writing skills, and give feedback to each other.
1. Basics of academic writing in English 1: Paragraph writing
2. Basics of academic writing in English 2: Making an outline
3. Fundamental structure of research paper: Structural analysis

4. Oral presentation: Journals, instructions for authors, and citation styles
5. Writing 1: Title and abstract
6. Writing 2: Research method
7. Writing 3: Results and discussions
8. Writing 4: Introduction and conclusion

●Textbook

No textbook for this class. Handouts will be distributed in class.

●Additional Reading

Glasman-Deal, H. (2021). Science Research Writing: For Non-Native Speakers of English. Imperial College Press.
Paltridge, B. (2019). Thesis and Dissertation Writing in a Second Language. Routledge.
Swales, J.M. & Feak, C.B. (2012). Academic Writing for Graduate Students. The University of Michigan Press.
Wallwork, A. (2013). English for Academic Research: Grammar, Usage and Style. Springer.
Wallwork, A. (2016). English for Writing Research Papers. Springer.

●Grade Assessment

The following evaluation items constitute the maximum score of 100:
Class Participation (25%)
Homework Assignments (35%)
Oral Presentation (10%)
Mini-Research Paper (30%)
A student must evidence a total score of 60 or higher on the final grading scale to pass this course.

●Notes

-No prerequisite.
-There is a chance to redesign the class format, schedule, and grading system depending on the COVID-19 situation.
-There will be approximately six face-to-face classes and two online (synchronous or on-demand) classes.
-Online, synchronous classes will be given on Zoom, whereas the on-demand classes will be given on NUCT.
-The first class will be met face-to-face in the regular classroom on campus, and the class format in the remaining semester will be announced via "Messages" on NUCT.
-Students are expected to express/exchange their ideas and opinions on NUCT and/or on another interactive presentation system to be announced in class.
-An active dialog is highly valued in this class, so your enthusiastic participation is vital to the success of your learning.
-Basically, homework is assigned on a weekly basis.

●Contacting Faculty

Use the "Messages" tool on NUCT to contact the instructor. Only for a limited period of time (until the secondary course registration period ends), you can reach the instructor by email.
smrym(at)lets.chukyo-u.ac.jp
Please replace (at) with @, the at symbol.