

Advanced Lectures on Dynamical System Theory(2.0credits)(動的システム論特論)

Course Type	Core major courses/Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Automotive Engineering
Starts 1	1 Autumn Semester
Lecturer	Tsuyoshi INOUE Professor

Course Purpose

Advanced lectures on the fundamental and applied subjects of the dynamical system. Particle system, rigid body system with constraints will be described. Moreover, the analytical techniques, concepts in the dynamical analysis for these systems will be described.

Prerequisite Subjects

Mathematics I,II with Exercises, Mechanics I,II with Exercise, Dynamical System Theory, Numerical Analysis

Course Topics

1. Dynamics of a particle and its basic analytical concept: Fixed point and its stability, \ 2. Dynamics of a particle and its advanced analytical concept: Analysis using first integral, \ 3. Cyclic coordinate and Routh's method \ 4. Map, fixed point and its stability \ 5. Dynamics of a rigid body (introduction of Euler angles and Euler parameters)

Textbook

Printed material will be distributed, or download page will be prepared.

Additional Reading

Analytical Dynamics, Haim Baruh; \ Applied Nonlinear Dynamics, A.H.Nayfeh

Grade Assessment

Evaluate based on the short report at each time and Reports(3-4 times) at the end of each part. Total score is 100, and credit will be awarded to those students who score 60 marks or more. Ranks are as follows: F(0-59), C(60-69), B(70-79), A(80-89) and S(90-100).

Notes

Contacting Faculty

Course Type	Core major courses/Basic 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	Fujio TAKIMOTO Designated Professor	

Course Purpose

In this course, students will learn about the advanced direct injection gasoline and gas engines.

Course objectives include

- (1)developing an understanding of the design and mechanics of direct injection gasoline and gas engines and,
- (2)reviewing revolutionary enabling technologies for direct injection gasoline and gas engines.

Prerequisite Subjects

Thermodynamics, Fluid Mechanics

Course Topics

1. Overview of gasoline direct injection engines
2. Stratified-charge combustion in gasoline direct injection engines
3. Turbocharged direct injection spark-ignition engines
4. Lean boost combustion system for improved fuel economy
5. EGR boosted gasoline direct injection engines
6. Gasoline direct injection engines with autoignition combustion
7. Design and optimization of direct injection engines using CFD
8. Natural gas direct injection engines
9. Biofuels for spark-ignition engines

Textbook

Printed handouts will be provided.

Additional Reading

Advanced direct injection combustion engine technologies and development, Volume1: Gasoline and gas engines, Edited by Hua Zhao, Woodhead Publishing Ltd. 2010

Grade Assessment

Grades will be based on class participation and reports.

30% for attendance

30% for interim report

40% for final report

Notes

Contacting Faculty

Students can ask questions at any time during classes.

Questions during off-class hours can be asked at the lecturer's room (Engineering Building No.3 North Wing, Room 223 (3125)) or via e-mail: takimotof@nuem.nagoya-u.ac.jp

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

Course Type	Core major courses/Core disciplinary 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

Will be introduced in the class.

Additional Reading

Grade Assessment

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

Notes

Contacting Faculty

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

Course Type	Core major courses/Core disciplinary 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

Will be introduced in the class.

Additional Reading

Grade Assessment

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

Notes

Contacting Faculty

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

Course Type	Core major courses/Core disciplinary 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

Will be introduced in the class.

Additional Reading

Grade Assessment

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

Notes

Contacting Faculty

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

Course Type	Core major courses/Core disciplinary 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

Will be introduced in the class.

Additional Reading

Grade Assessment

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

Notes

Contacting Faculty

Advanced Thermal Engineering(2.0credits)(熱工学特論)

Course Type	Core major courses/Core disciplinary courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Mechanical Engineering Science	Mechano-Informatics and Systems	Automotive Engineering
Starts 1	Automotive Engineering 1 the latter term 1 Autumn Semester	1 the latter term	1 Autumn Semester
Lecturer	Ichiro NARUSE Professor	Ryo YOSHIIE Associate Professor	

Course Purpose

To learn the fundamental knowledge of various energy conversion systems and technologies for energy saving and environmental protections. :Achievement purpose:1.to understand the basis of thermodynamics, and be able to make the calculation connected with them:2.to understand the principle of various energy conversion systems like combustion and gasification.:3.to understand the principle of global environmental problems, and be able to estimate the contribution of energy conversion systems to the global environment, using thermodynamic quantities such as exergy analyses.:

Prerequisite Subjects

Thermodynamics, Heat transfer, Energy conversion engineering

Course Topics

1.Material and energy resources:2.Local and global environmental problems:3.Combustion sciences:4.The principle of energy conversion systems:5.Environmental protection technologies:6.Environment-friendly technologies for high-temperature energy conversion:

Textbook

Handouts (as occasion demands)

Additional Reading

none

Grade Assessment

Exercises and reports:

Notes

Contacting Faculty

Send your questions by E-mail.

Advanced Lectures on System Dynamics(2.0credits)(システムダイナミックス特論)

Course Type	Core major courses/Core disciplinary courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Mechano-Informatics and Systems	Automotive Engineering	Automotive Engineering
Starts 1	2 the previous term	1 Spring Semester	1 Spring Semester
Lecturer	Shogo OKAMOTO Lecturer		

Course Purpose

Substantial difficulties of dynamic systems in the real world lie in the involvement of a large number of related factors that deviate statistically. Multivariate analyses and statistics are common tools for understanding and modeling these intricate systems. This course is arranged for those who had few opportunities to study statistics, multivariate analyses, and some basis for these mathematics. We learn intermediate topics of classic and modern multivariate analyses and related statistics. We also practice how to apply each method of multivariate analysis on real data and interpret the results throughout the course.

Prerequisite Subjects

Mathematics, especially, linear algebra of undergraduate level.

Course Topics

- 1-2 h: Introduction. Multivariate regression analysis.
- 3-4 h: Common mathematics comprising random variables, correlation matrix, and level of measurement.
- 5-6 h: Principal component analysis and factor analysis
- 7 h: Multidimensional scaling
- 8-9 h: Structure equation modeling (Covariance structure analysis)
- 10-11 h: Causality analysis or graphical modeling using partial correlation coefficients (Covariance selection)
- 12-13 h: Modern multivariate analysis (Nonlinear methods)
- 14 h: Preparation for the final presentation
- 15 h: Final presentation

Textbook

Will be provided on site.

Additional Reading

1. Yutaka Tanaka, Tomoyuki Tarumi, Handbook of statistical analysis, Kyoritsu Shuppan, 1995. (In Japanese)
2. Shotaro Akaho, Kernel multivariate analysis, Iwanami Shoten, 2008. (In Japanese)

Grade Assessment

Three reports (60%) and one presentation (40%) are collectively evaluated. We will have chances of quiz reports 6 or 7 times in total, and at least 3 reports should be submitted. If you submit more than 4 reports, 3 best ranked reports will be considered for the final evaluation. Also, all students have to prepare for the final presentation, on which real world data is examined with one of the analysis methods.

Notes

Nothing especially.

Contacting Faculty

Any time by e-mails or direct visits.

Advanced Lectures on Strength and Fracture of Materials(2.0credits)(材料強度学特論)

Course Type	Core major courses/Core disciplinary courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Mechanical Engineering Science	Mechano-Informatics and Systems	Automotive Engineering
Starts	1 the previous term 1 Spring Semester	1 the previous term	1 Spring Semester
Lecturer	Kouji MIZUNO Professor		

Course Purpose

Prerequisite Subjects

Biomechanics, Automotive engineering

Course Topics

1. Impact biomechanics 2. Crash dummy 3. Structural deformation 4. Frontal impact 5. Occupant protection 6. Side impact 7. Compatibility 8. Pedestrian protection, 9. Child occupant protection 10. Accident reconstruction 11. Whiplash injury

Textbook

Additional Reading

Grade Assessment

Reports

Notes

Contacting Faculty

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

Course Type	Core major courses/Core disciplinary courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Mechatronics	Automotive Engineering	Automotive Engineering
Starts 1	1 the latter term	1 Autumn Semester	1 Autumn Semester
Lecturer	Toshiro MATSUMOTO Professor		

Course Purpose

Fundamentals and applications of some major computational techniques currently used to analyze mechanical behaviors of continuum media are given.

Prerequisite Subjects

Designs of Mechanical Systems, Computer Software 1, Computer Software 2

Course Topics

1. Mathematical modeling and computer simulation of physical phenomena 2. Index notation and some mathematical formula 3. Theories of finite element method and boundary element method 4. Industrial applications of CAE

Textbook

Additional Reading

Grade Assessment

Reports or examination.

Notes

Contacting Faculty

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

Course Type	Core major courses/Core disciplinary 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	"FUJII Toshiaki" Professor
	Hiraku okada Associate Professor	Keita Takahashi Associate Professor	

Course Purpose

This lecture focuses on wireless communication and image processing technologies which are fundamental to automotive engineering.

Prerequisite Subjects

Course Topics

- wireless control system- visual light communication- wireless network - basics of image signal processing- 3D image sensing- visual signal communication

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

Credits will be awarded to those students who score 60 or more in course works and reports. Grades are as follows: S:100-90, A:89-80, B:79-70, C:69-60, F:59-0.

Notes

Contacting Faculty

Questions are attended during the classes.

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	Core major courses/Core disciplinary 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

This course deals with the basis of fundamental science and engineering related to automobiles through experiments.

Textbook

Additional Reading

Grade Assessment

Grading will be decided based on attendance and the quality of the students' contribution to the experiments.

Notes

Contacting Faculty

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	Core major courses/Core disciplinary 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

This course deals with the basis of fundamental science and engineering related to automobiles through experiments.

Textbook

Additional Reading

Grade Assessment

Grading will be decided based on attendance and the quality of the students' contribution to the experiments.

Notes

Contacting Faculty

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

Course Type	Core major courses/Extra-disciplinary 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 Matsumura Professor Hiroki KOJIMA Associate Professor	Naoki HAYAKAWA Professor	Yasunobu YOKOMIZU 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. Electromagnetics: electric field, magnetic field, electromagnetic induction, etc. 2. Electric energy: thermodynamics, 3-phase ac, rotating magnetic field, etc. 3. Electric power apparatus: generators, motors, breakers, etc. 4. Electric power transmission system for inverter-fed motor systems, etc.

Textbook

Distribution of handout

Additional Reading

Grade Assessment

Reports Credits will be awarded to those students who score 60 or more. Grades are as follows: S:100-90, A:89-80, B:79-70, C:69-60, F:59-0.

Notes

Contacting Faculty

Yasunobu Yokomizu: yokomizu@nuee.nagoya-u.ac.jp
Hiroki Kojima: kojima@nuee.nagoya-u.ac.jp
Toshiro Matsumura: matsumura@nuee.nagoya-u.ac.jp
Naoki Hayakawa: nhayakaw@nuee.nagoya-u.ac.jp

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

Course Type	Core major courses/Extra-disciplinary 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	Hiroshi AMANO Professor	Yutaka ONO Professor	Hiroki KONDOH Associate Professor

Course Purpose

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

Prerequisite Subjects

Fundamental Physics Thermodynamics and Tutorials

Course Topics

Ch.1 Energy Bands and Carrier Concentration in Thermal Equilibrium
 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

Textbook

Semiconductor Devices Physics and Technology International Student Version Third Edition
 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%)
 <enrolled student after Apr.(2011)>S:100-90 points, A:89-80 points, B:79-70 points, C:69-60 points, F:<60 points
 <enrolled student before Mar.(2011)>A:100-80 points, B:79-70 points, C:69-60 points, D: <60 points

Notes

Contacting Faculty

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

Course Type	Core major courses/Extra-disciplinary 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	Satoshi SATOH Professor	Nobuo KAWAGUCHI Professor	Tetsu IWATA Associate Professor
	Takuya MATSUZAKI Associate Professor	Tomohiro YOSHIKAWA Associate Professor	

Course Purpose

This lecture covers several topics related to information systems, which include statistical hypothesis testing, logic, operating system, algorithmic techniques, and information security.

Prerequisite Subjects

Course Topics

1. statistics, statistical hypothesis testing, multiple comparison
 2. propositional logic, predicate logic, formal proof
 3. network protocols, operating system, programming languages
 4. algorithmic techniques, search, dynamic programming
 5. information security, cryptography, data authentication

Textbook

Additional Reading

Grade Assessment

Reports.

Notes

Contacting Faculty

During and after lectures.

Advanced Lectures on Mathematical Analysis of Heat Transfer(2.0credits)(数理伝熱学)

Course Type	Sub-major courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Mechanical Engineering Science	Mechano-Informatics and Systems	Aerospace Engineering
	Automotive Engineering	Automotive Engineering	
Starts 1	1 the previous term 1 Spring Semester	1 the previous term 1 Spring Semester	1 the previous term
Lecturer	Hosei NAGANO Professor		

Course Purpose

- To understand how to utilize knowledge of heat transfer in real world, and think about their purpose (thermal management, serious energy problem, and global warming)
- To understand the importance of thermal management.
- To understand about trend of research and development for thermal & energy management in engineering field (Not limited to space field)
- To understand about space thermal environment and how thermal control is conducted for spacecraft.

Prerequisite Subjects

Heat transfer engineering

Course Topics

- Lectures on applied heat transfer.
- Presentation and discussion on applied heat transfer including thermal management in various field (Spacecraft, Aircraft, Automobile, Housing, Computers, Electric device etc.), thermal energy utilization (Thermoelectric device, Geothermal binary power generation, Cogeneration technology), global warming and heat island, and other related topics.

Textbook

NA

Additional Reading

NA

Grade Assessment

Reports, presentation, and discussion.

Notes

Contacting Faculty

Advanced Battery Systems for Future Automobiles(2.0credits)(次世代自動車用電池の開発)

Course Type	Sub-major 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	Li Oi Lun helena Lecturer	

Course Purpose

This course will provide the basics of the development and protection of batteries in electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs). The study and insightful understanding of this topic is of immense importance to the future of the electric vehicle industry. The lecture will be provided in English

Prerequisite Subjects

電気化学

Course Topics

This course will cover (1) metal-ion batteries (2) lithium air batteries (3) fuel cells (4) hybrid system. The fundamental chemistry, material requirements, criteria, safety and handling of each type of batteries will be discussed in details.

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

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

Course Type	Sub-major 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	Akira URITANI Professor	

Course Purpose

In this course, students study ionizing radiations, activity, radiation detections. Students will also study how ionizing radiations are powerful tools in manufacturing industries.

Prerequisite Subjects

nothing in particular

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

Textbook

nothing in particular

Additional Reading

nothing in particular

Grade Assessment

Grades will be assigned based on reports.

Grade points

S:100-90

A:89-80

B:79-70

C:69-60

F:59-0

Notes

Contacting Faculty

Call ext.3797

e-mail to uritani@nucl.nagoya-u.ac.jp

Advanced Lectures on Chemical Engineering(2.0credits)(化学工学特論)

Course Type	Sub-major 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	Faculty of Automotive Engineering	

Course Purpose

This course discusses chemical engineering, such as mass balance, transport phenomena, reaction engineering, powder technology, and material engineering.

Prerequisite Subjects

Automotive Chemical Systems I, II

Course Topics

Chemical Engineering: 1. Introduction, automotive and chemical engineering 2. Mass and energy balance 3. Mass and heat transfer 4. Fluid dynamics 5. Reaction engineering 6. Particle and powder technology 7. Material engineering

Textbook

Handouts will be distributed in class.

Additional Reading

N/A

Grade Assessment

Grades will be based on reports and an examination. Students must obtain a score of 60 or higher to pass the course. Grades: S: 100-90, A: 89-80, B: 79-70, C: 69-60, G: 59-0.

Notes

Contacting Faculty

Students can ask questions during and at the end of lecture, or via email. T.TAGAWA: tagawa@nuce.nagoya-u.ac.jp, Y.TANABE:y.tanabe@nuce.nagoya-u.ac.jp, H.KITA: hkita@nuce.nagoya-u.ac.jp, N.KOBAYASHI: koba@nuce.nagoya-u.ac.jp, Y.KOJIMA: ykojima@esi.nagoya-u.ac.jp or K.YASUDA: yasuda@nuce.nagoya-u.ac.jp

Transportation Systems Analysis(2.0credits)(交通システム分析)

Course Type	Sub-major 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	Takayuki MORIKAWA Professor	Toshiyuki YAMAMOTO Professor

Course Purpose

To understand approaches and methods to analyze travel behavior and demands for various transportation systems

Prerequisite Subjects

Statistics, Transportation Planning

Course Topics

1. Transportation policies and transportation systems analysis
2. Travel demand and travel survey
3. Aggregate demand model 1 – Trip generation & production/attraction
4. Aggregate demand model 2 – Trip distribution
5. Aggregate demand model 3 – Modal split
6. Traffic assignment on network 1
7. Traffic assignment on network 2
8. Traffic assignment on network 3
9. Traffic simulation 1
10. Traffic simulation 2
11. Disaggregate demand model 1 – Binary choice
12. Disaggregate demand model 2 – Multinomial choice
13. Disaggregate demand model 3 – Estimation and statistical test
14. Disaggregate demand model 4 – Aggregation and forecast
15. Disaggregate demand model 5 – Multi-dimensional choice

Textbook

None

Additional Reading

"Modeling Travel Behavior" by Kitamura, Morikawa, Sasaki, Fujii, & Yamamoto (in Japanese)

"Discrete Choice Analysis" by Ben-Akiva and Lerman

"Discrete Choice Methods with Simulation" by Train

Grade Assessment

Exam & reports

Notes

Contacting Faculty

Advanced Traffic Engineering and Management(2.0credits)(交通工学特論)

Course Type	Sub-major courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Civil Engineering	Automotive Engineering	Automotive Engineering
Starts 1	1 the previous term	1 Spring Semester	1 Spring Semester
Lecturer	Hideki NAKAMURA Professor		

Course Purpose

There is no doubt that a considerable portion of pollution emissions is resulted from transportation related activities and vehicular movements in particular. Managing traffic safely and efficiently is one of the most effective solutions to relieve environmental issues worldwide. Training specialists who have the knowledge and skills of traffic engineering is highly demanded especially in developing countries where travel demand is rapidly increasing despite insufficient transportation infrastructure. In this course, fundamentals and internationally forefront issues in traffic engineering are to be covered in theory and practice, so that students can effectively master the most important issues for practicing in highway planning and traffic operations.

Prerequisite Subjects

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.INTERSECTIO

Textbook

N.A.

Additional Reading

- Elefteriadou, L.: "An Introduction to Traffic Flow Theory", Springer, 2014.
- Transportation Research Board, Special Report 209, "Highway Capacity Manual", National Research Council, Washington, D.C., 2010.

Grade Assessment

Exam or reports

Notes

Contacting Faculty

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	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Quantum Science and Energy Engineering	Applied Physics
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Graduate Chemistry
	Graduate Chemistry	Graduate Chemistry	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 the previous term	1 the previous term	1 the previous term
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester		
Lecturer	Yukio ISHIDA 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.

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. Fuel and Automobile Catalysts for Environmental Friendly Cars.
 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. Yokohama Rubber Co. Ltd., 4. Suzuki Museum, 5. Toyota Higashi-Fuji Technical Center, 6. Nissan Technical Center
 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.

Textbook

None (Handout delivered)

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.

Notes

Contacting Faculty

Mainly accepted during each lecture. Other general questions are accepted by Professor Yukio Ishida. <Contact> TEL: 052-747-6797, Email: ishida@nuem.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	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 Autumn Semester
Lecturer	Reiko FURUYA Associate Professor		

Course Purpose

This course is intended to help students learn the skills necessary for making an effective presentation in a language (either Japanese or English) different from their native tongue. Japanese students will make presentations in English, and international students in Japanese.

Prerequisite Subjects

Course Topics

(1) Observing video-taped presentations:By watching model presentations, students will see how an effective presentation is made and learn techniques useful for their own presentations. : (2) Making a presentation:By using presentation techniques discussed

Textbook

none

Additional Reading

Please refer to the Japanese version of this syllabus.

Grade Assessment

Evaluation will be based on presentations and class participation.:

Notes

Contacting Faculty

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Seiichi MIYAZAKI Professor		

Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. :Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

Textbook

not specified.

Additional Reading

not specified.

Grade Assessment

The credits will be given to the students who have had the working days less than or equal to 20 days in the internship company.

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Seiichi MIYAZAKI Professor		

Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

Textbook

not specified.

Additional Reading

not specified.

Grade Assessment

The credits will be given to the students who have had the working days between 21 and 40 days in the internship company.

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Seiichi MIYAZAKI Professor		

Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. :Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

Textbook

not specified.

Additional Reading

not specified.

Grade Assessment

The credits will be given to the students who have had the working days between 41 and 60 days in the internship company.

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Seiichi MIYAZAKI Professor		

Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

Textbook

not specified.

Additional Reading

not specified.

Grade Assessment

The credits will be given to the students who have had the working days between 61 and 80 days in the internship company.

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 the previous term and latter term
	1 the previous term and latter term	1 the previous term and latter term	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Seiichi MIYAZAKI Professor		

Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

Textbook

not specified.

Additional Reading

not specified.

Grade Assessment

The credits will be given to the students who have had the working days more than or equal to 81 days in the internship company.

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

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	Applied Chemistry	Chemical Engineering	Biotechnology
	Materials Science and Engineering	Applied Physics	Quantum Science and Energy Engineering
	Electrical Engineering	Electronics	Communications and Computer Science
	Mechanical Engineering Science	Mechano-Informatics and Systems	Mechatronics
	Aerospace Engineering	Civil Engineering	Crystalline Materials Science
	Energy Engineering and Science	Quantum Engineering	Micro-Nano Systems Engineering
	Molecular Design and Engineering	Computational Science and Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 the latter term
	1 the latter term	1 the latter term	1 Autumn Semester
Lecturer	Part-time Faculty		

Course Purpose

Students will acquire basic skills to summarize their research as a paper in English and to make a presentation in English.

Prerequisite Subjects

Various subjects relating to English

Course Topics

This course focuses on guided practice in written and spoken English in academic and scientific contexts. Students are expected to write short essays, respond to questions from peers and improve their academic quality.

1. Basics of academic writing
2. Unity and coherence
3. Paragraph structures in scientific context
4. Audience-friendly presentation

Textbook

Additional Reading

Glasman-Deal, Hilary. "Science Research Writing: A Guide for Non-Native Speakers of English" Imperial College Press.

Grade Assessment

Quality of written and oral presentation, active participation in discussion, and attendance

Notes

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

This course is open to native and non-native speakers of English who have not received training in logical and critical thinking skills in English.

Contacting Faculty

Email address to be announced in the first class