

Subject Descriptions

Material, Structural and Energy Engineering Course

Departmental Curriculum

Dissertation I on Material, Structural and Energy Engineering
Dissertation II on Material, Structural and Energy Engineering
Special Field Works
Special Educational Training
Internship I & II

Processing Development Engineering

Materials for Sustainable Engineering (Oshikawa, W.)

This lecture focuses on corrosion degradation of materials under various environments.

Special Topics in Manufacturing Process (Shibata, S.)

This lecture focuses the analysis and design of polymer composites materials in manufacturing system.

Advanced Computational Mechanics (Kondou, R.)

This lecture focuses on analyses based on FEM and physics-based model for elastoplastic deformation and dislocation.

Advanced Material Function Development of New Construction Material (Yamada, Y.)

This lecture focuses on durability of concrete and rheology of fresh concrete.

Advanced Reinforced Concrete Structures (Nakada, K.)

Confined Concrete, Flexural strength, Shear resistance mechanism, Collapse mechanism.

Advanced Electronic Functional Materials (Higa, A.)

Semiconductor, Amorphous Materials, Processing of Thin Films.

Advanced Plasma Engineering (Yonesu, A.)

Plasma processing, Nuclear fusion.

Organic Electronics Device Engineering (Kageyama, H.)

Lectures on properties of organic electronics materials and physics of organic electronics devices

Advanced Ferromagnetic Materials (Yamamoto, K.)

Ferromagnetic Materials, Domain Theory, Magnetization Process.

Topics on Ferroelectric Crystals (Fukami, T.)

Lecture on structural phase transitions of ferroelectric and superionic crystals

Quantum Physics of Materials (Maehira, T.)

The students will study the basic electron theory in solids

Advanced Physics of Disordered Materials (Tahara S.)

Lecture on structure and physical properties of liquid and amorphous materials.

Energy Development Engineering

Advanced Heat Transfer Engineering (Senaha, I.)

Advanced lecture on heat and mass transfer by turbulent flow of a forced convection or a conduction phenomena.

Advanced Study on Transport Phenomena (Nosoko, T.)

Advanced analysis of heat transfer and mass transfer, Modeling of heat and mass transfer Phenomena.

Heat Transfer Augmentation (Nosoko, T. / Senaha, I.)

This lecture focuses on the theory of thermal energy transfer. Moreover, heat and mass transfer augmentation technique in convective flow are discussed.

Advanced Fluid Dynamics (Yaga, M.)

Lecture on the concept of high speed gas flow and shock waves using the governing equation of fluid dynamics and thermodynamics.

Advanced Energy Conversion (Yaga, M.)

Study on the mechanism of heat transfer between high speed flow and impinged plate using experimental and numerical technique.

Advanced Wind Engineering for Building Structures (Castro, J. J.)

This course focuses on the fundamental concepts for the design of wind proof structures. Studying of expected wind velocity return period, wind pressures and forces on structures.

Advanced Coastal Engineering on Coral Seas (Nakaza, E.)

Dynamics of non-linear waves, Deformation of waves on coral reefs, Surf beat and other long period waves, Coastal stabilization, Design of maritime structures and coastal resort areas, Ecosystems in tropical seas and coasts.

Advanced Control of Electric Power Energy (Urasaki, N.)

Conversion and the control method of the electric power energy using the power electronics technology.

Strongly-Correlated Materials Science (Aso, N.)

Fundamentals and applications of strongly-correlated materials science are introduced using English textbooks.

Properties of Condensed Matter under Multiple-Extreme Conditions (Hedo, M.)

Overview of transport, magnetic and thermal properties in heavy fermion system around quantum critical point, and introduction of methods of obtaining low temperatures and high pressures

Magnetism in Condensed Matter Physics (Yasuda, C.)

Lecture on magnetism and phase transition in quantum spin systems

Advanced Magnetic Resonance in Solids (Yogi, M.)

Advanced lecture on NMR and NQR spectroscopy for strongly correlated electron systems.

Interdisciplinary Intelligent Systems Engineering Course

Departmental Curriculum

Dissertation I on Interdisciplinary Intelligent Systems Engineering
Dissertation II on Interdisciplinary Intelligent Systems Engineering
Special Field Works
Special Educational Training

Environment and Information Engineering

Advanced Sustainable Regional Development (Ando, T.)

Under developing countries, Sustainable development, Appropriate technology.

Advanced Theory of Community Living Space Planning (Shimizu, H.)

Theory of urban planning and regional planning with a point of view of social space systems. Theory investigation through case study. Development process and characteristic of community space in Okinawa as a case study of relationship between local culture and regional living space.

Advanced Urban and Regional Planning System (Ono, H.)

Urban and regional planning system is for learning the planning systems, existing systems, analysis method on each case in several countries. If necessary, we will compare and analyze overseas urban planning and legal systems and actual conditions.

Advanced Acoustic Architectural Design (Tokashiki, T.)

Room acoustics, Reverberation times, Auditorium, Road traffic noise, Absorption coefficient, Insulation ability

Advanced Regional Planning Systems and Methodology (Kamiya, D.)

Planning systems and methodology on environmental creation, disaster risk management and traffic management considering regional characteristics are illustrated and discussed in the class.

Advanced Wave Signal Processing (Fujii, S.)

Imaging of invisible information with wave signal, Holographic imaging in acoustic and radio waves, Synthetic aperture radar.

Advanced Parallel and Distributed Systems (Nakamura, M.)

Parallel machine architecture, Design and verification of parallel and distributed algorithms.

Advanced Emergent and Intelligent Robotics (Yamada, K.)

Emergent Computation, Evolutionary Computation, Multi Agent System, Collective Intelligence and Swarm Intelligence for Robotics.

Advanced Mathematical Modeling (Okazaki, T.)

Advanced lecture on mathematical statistics, computational statistics, data science, bio science and human behavior modeling.

Advanced Software Systems (Kono, S.)

Software system development, Large program, Object oriented systems, Persistent object, Verification, Test.

Advanced Image Processing (Nagayama, I.)

Digital Image Processing, Cognitive Science, Machine Learning, Social Application, Smart System.

Introduction to Numerical Relativity (Uryu, K.)

A course for studying methods for numerically solving Einstein's equation coupled with the equations for relativistic fluid. Numerical relativity is a tool to analyse spacetime dynamics and relativistic astrophysical phenomena.

Physics of Correlated Electrons (Shiina, R.)

Theoretical understandings on new phenomena of correlated electrons in solid states are lectured.

Introduction to the Structure of Space-time (Taniguchi, K.)

Advanced general relativity and the structure of space-time

Advanced HCI (Tamaki, E.)

Design methods and models, and system evaluation methods in HCI (Human-Computer Interaction). Discussion based on the latest research results.

Research Methods in Intelligent Engineering I - II (Tamaki, E.)

Preparation of the dissertation, discussion of the validity of the research plan, evaluation of the research results

Electronics and Information Engineering

Advanced Adaptive Systems (Kinjo, H.)

Advanced lecture on adaptive methods: Fuzzy systems, Neural networks, Genetic algorithms.

Advanced Intelligent Control Systems (Senjyu, T.)

Optimization algorithm, Neural network, Fuzzy control, Nonlinear control, Intelligent system.

Advanced Asynchronous Systems (Nagata, Y.)

Asynchronous circuit design, Asynchronous micro-chip, Delay models, Field programmable gate array, Micro-pipeline.

Advanced Biomedical Engineering (Higa, H.)

Bioinstrumentation, Assistive technology, Functional Electrical Stimulation, EEG signal processing.

Advanced Computer Control Theory (Nagado, T.)

Conversion method of models, Descriptive method of models, Controlling apparatus, Method of decreasing dimension.

Advanced Intelligent Systems (Endo, S.)

Advanced lecture on multi-agent systems. Chaotic systems and evolutionary computation techniques. Design and development of complexity intelligent systems are also discussed.

Advanced System Architecture (Wada, T.)

Large Digital Signal Processing System Design with Electronic Design Automation tools.

Advanced Machine Learning (Kang, D.)

This lecture describes basic concepts in machine learning and data mining, and then introduces examples of applications.

Introduction to Superstring Theory (Oda, I.)

Lecture on superstring theory from the elementary level to the more advanced level.

Advanced Electronic Properties of Molecular Solids (Yanagisawa, S.)

I focus on advanced electronic structure methods for properties of organic solids: from density functional theory to many-body electronic structure theory.

Advanced Information Theory (Nakachi, T.)

Advanced lecture on information theory and its applications: sparse modeling, distributed source coding, information and communication security.