Syllabus

2016

Department of Maritime Engineering

(Incl. Special Course on Ocean Development)

Graduate School of Engineering

Kyushu University

【破壊管理工学特論】

Code	M114	Title	Advanced Course in Fracture Control Design
Category	Advanced specialized subject	**Activities**	Lecture (Problem Based Learning type)
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Koji GOTOH	**Keywords**	Fatigue, Fracture mechanics
	Phone: 092-802-3457 E-mail: gotoh@nams.kyushu-u.ac.jp Room: Ito Campus, W2-731	**Course Requirements**	It is required to understand the fundamental knowledge of strength of materials, elasticity, plasticity and materials applied large welded structures (mainly steels).
Outline	To investigate and discuss some famous fractured accident in large weld structures. 1. Investigate each accident 2. Presenting an overview of accident 3. Discussing the results of presented investigation.		

【生産システム工学】

Code	M115	Title	Production Systems of Hull Structures
Category	Advanced specialized subject	**Activities**	Lecture
Period	Intensive lecture, 1st year student	**Credit**	2
Instructor, Contact Information	Koji GOTOH	**Keywords**	Hull construction
	Phone: 092-802-3457 E-mail: gotoh@nams.kyushu-u.ac.jp Room: Ito Campus, W2-731	**Course Requirements**	It is required to having interesting hull construction stages in shipyard.
Outline	Overview of hull construction made of steels. 1. History of hull construction. 2. Method of hull construction (assembly, fabrication, welding, painting, launching, etc.) 3. Facility of shipyards 4. Production management in shipyard 5. Quality control and assurance 6. Safety management in shipyards.		

【溶接設計第一】

Code	M116	Title	Welding Design I
Category	Advanced subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Koji GOTOH	**Keywords**	Steels, Weld materials, Stainless steels, Aluminium, Titanium, Strength of welded joint, Residual stress, Deformation by welding
	Phone: 092-802-3457 E-mail: gotoh@nams.kyushu-u.ac.jp Room: Ito Campus, W2-731	**Course Requirements**	It is required to understand the fundamental knowledge of strength of materials, elasticity, plasticity, metallurgy of steels and thermal conduction in metals.
Outline	Fundamental and practical knowledge of welding mechanics (Required knowledge of international welding engineers.) 1. Strength of welded joints (Static, Brittle, Fatigue strengths) 2. Residual stress and deformations caused by welding 3. Practical calculation methods of the strength of welded joins. 4. Steels and their weldability 5. Stainless steels, Aluminium alloys and Titanium alloys and their weldability 6. Corrosion of metals.		

【溶接設計第二】

Code	M119	Title	Welding Design II
Category	Advanced subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Koji GOTOH	**Keywords**	Welding, Thermal cutting, Steels, Weld materials, Production management, Welding specification procedures, Defects in welded joints, NDT
	Phone: 092-802-3457 E-mail: gotoh@nams.kyushu-u.ac.jp Room: Ito Campus, W2-731	**Course Requirements**	It is required to understand the fundamental knowledge of strength of materials, elasticity, plasticity, metallurgy of steels and thermal conduction in metals.
Outline	Fundamental and practical knowledge of welding mechanics (Required knowledge of international welding engineers.) 1. Welding methods 2. Fundamentals of welding phenomenon 3. Thermal cutting methods 4. Production managements and quality assurance of welded joints 5. Welding specification procedures 6. Prevention of welding defects 7. Overview of non-destructive tests (NDT) for welded joints		

【連続体力学】

Code	M220	Title	Continuum Mechanics I
Category	Advanced subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Yukitaka YASUZAWA, Takeshi SHINODA	**Keywords**	Tensor analysis, Continuum mechanics, Covariant derivative, Curved shell
	Phone: 092-802-3455 E-mail: yasuzawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-729	**Course Requirements**	It is required to understand fundamentals on deformable bodies.
Outline	This lecture focuses on tensor analysis for continuum mechanics on arbitrary coordinate system and preparing for curved shell theory.		

【構造安定論】

Code	M221	Title	Continuum Mechanics II
Category	Advanced specialized subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Takao YOSHIKAWA	**Keywords**	Buckling, Static and dynamic stability of structure
	Phone: 092-802-3454 E-mail: yoshikawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-728	**Course Requirements**	It is required to understand the basics of material mechanics and structural strength.
Outline	The analytical procedures for solving for problems of Static and Dynamic Stability will be lectured. The students must explain the cause and counter measures for some stability troubles which were happened previously. (In Japanese)		

【応用数理学】

Code	M222	Title	Applied Mathematics for Design
Category	Advanced subject	**Activities**	Lecture
Period	1st (spring) term, 2nd year student	**Credit**	2
Instructor, Contact Information	Takashi TANAKA	**Keywords**	Mathematical models, Nonlinear, Chaos
	Phone: 092-802-3458 E-mail: tanaka@nams.kyushu-u.ac.jp Room: Ito Campus, W2-732	**Course Requirements**	None
Outline	This lecture focuses on mathematical models and chaotic phenomena as one of nonlinear sciences.		

【応用リスク解析学】

Code	M249	Title	Applied Risk Analysis
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Takeshi SHINODA	**Keywords**	Risk analysis, Risk assessment, Evaluation and decision making
	Phone: 092-802-3459 E-mail: shinoda@nams.kyushu-u.ac.jp Room: Ito Campus, W2-733	**Course Requirements**	None
Outline	This lecture focuses on the structure of risk assessment and applications for risk analysis methods.		

【海洋浮体工学特論】

Code	M1631	Title	Advanced Course of Offshore Structure Engineering
Category	Advanced subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Yoshitaka FURUKAWA	**Keywords**	Marine dynamics, Motion of floating body, Hydrodynamics
	Phone: 092-802-3448 E-mail: furukawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-630	**Course Requirements**	It is required to understand hydrodynamics and dynamics and control of ships.
Outline	This lecture focuses on hydrodynamic forces acting on floating bodies and their motion dynamics.		

【船舶運動特論】

Code	M1632	Title	Advanced Course of Dynamics of Ships
Category	Advanced specialized subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Yoshitaka FURUKAWA	**Keywords**	Marine dynamics, Ship stability, Ship manoeuvrability, Prevention of marine accidents
	Phone: 092-802-3448 E-mail: furukawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-630	**Course Requirements**	It is required to understand hydrodynamics and dynamics and control of ships.
Outline	This lecture focuses on ship manoeuvrability and prevention of marine accidents.		

【流体力学特論第一】

Code	M1633	Title	Advanced Hydrodynamics I
Category	Advanced subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Yoshitaka FURUKAWA	Keywords	Perturbation theory, Approximation algorithm, Hydrodynamics
	Phone: 092-802-3448 E-mail: furukawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-630	Course Requirements	It is required to understand hydrodynamics.
Outline	This lecture focuses on perturbation theory for the prediction of hydrodynamic forces.		

【流体力学特論第二】

Code	M1634	Title	Advanced Hydrodynamics II
Category	Advanced subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Yoshitaka FURUKAWA	Keywords	Hydrodynamics, Complex function theory
	Phone: 092-802-3448 E-mail: furukawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-630	Course Requirements	It is required to understand hydrodynamics and complex function theory.
Outline	This lecture focuses on the application of complex function theory for hydrodynamics.		

【システム設計特論】

Code	M1635	Title	Advanced Course of Systems Design Engineering
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Hajime KIMURA	Keywords	linear regression, Optimization algorithms, Markov process, Dynamic programming
	Phone: 092-802-3452 E-mail: kimura@nams.kyushu-u.ac.jp Room: Ito Campus, W2-634	Course Requirements	It is required to understand basic knowledge of Calculus and Linear Algebra and computer programming.
Outline	This lecture presents methodology to solve various optimization problems making use of computers.		

【船舶基本設計特論】

Code	M1636	Title	Advanced Basic Design for Ships
Category	Advanced subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Satoru YAMAGUCHI	Keywords	Preliminary Design, Basic Design
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735	Course Requirements	It requires fundamental knowledge of ship design.
Outline	This lecture focuses on preliminary and basic design of ship.		

【制御工学特論】

Code	M1637	Title	Advanced Course of Control Engineering
Category	Advanced specialized subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Hiroyuki KAJIWARA	Keywords	LPV control, LMI-based design
	Phone: 092-802-3441 E-mail: kajiwara@nams.kyushu-u.ac.jp Room: Ito Campus, W2-633	Course Requirements	State-space Approach to control system design
Outline	This lecture focuses on LPV (Linear Parameter Varying) control technology by LMI (Linear Matrix Inequality) based design for gain-scheduling control and robust control.		

【海洋エネルギー利用計画】

Code	M1638	Title	Application of Energy from the Ocean
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Satoru YAMAGUCHI	Keywords	Ocean, Energy, Wave, Current, Wind
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735	Course Requirements	It requires fundamental knowledge of hydrodynamics.
Outline	This lecture focuses on application of ocean energy.		

【船舶海洋抵抗特論】

Code	M1639	Title	Advanced Theory of Resistance for Ship and Marine Structures
Category	Advanced subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Jun ANDO	Keywords	Viscous flow, Boundary layer calculation, Potential flow around body, Wave-making resistance
	Phone: 092-802-3449 E-mail: ando@nams.kyushu-u.ac.jp Room: Ito Campus, W2-631	Course Requirements	It is required to understand hydrodynamics.
Outline	This lecture focuses on hydrodynamics about flow around body and resistance acting on body.		

【船舶海洋推進特論】

Code	M1640	Title	Advanced Theory of Propulsion for Ship and Marine Structures
Category	Advanced subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Jun ANDO	Keywords	Wing theory, Propeller, Cavitation, Wind turbine
	Phone: 092-802-3449 E-mail: ando@nams.kyushu-u.ac.jp Room: Ito Campus, W2-631	Course Requirements	It is required to understand hydrodynamics.
Outline	This lecture focuses on hydrodynamic about wing and propeller.		

【船舶海洋流体力学特論】

Code	M1641	Title	Advanced Marine Hydrodynamics
Category	Advanced specialized subject	Activities	Intensive lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Jun ANDO	Keywords	Hydrodynamics, Numerical analysis method
	Phone: 092-802-3449 E-mail: ando@nams.kyushu-u.ac.jp Room: Ito Campus, W2-631	Course Requirements	It is required to understand hydrodynamics and numerical analysis method.
Outline	This lecture focuses on computational fluid dynamics.		

【船舶コンピュータ支援設計製図】

Code	M1642	Title	CAD for Ship Design
Category	Advanced subject	Activities	Lecture and Practice
Period	2nd (fall) term, 1st year student	Credit	3
Instructor, Contact Information	Satoru YAMAGUCHI	Keywords	Drawing, CAD
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735	Course Requirements	It requires fundamental knowledge of naval architecture and the credit of “Advanced Basic Design for Ships”.
Outline	This lecture focuses on ship design using CAD software.		

【船舶海洋構造力学特論】

Code	M1651	Title	Advanced Structural Mechanics of Marine Structures
Category	Advanced subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Takao YOSHIKAWA	Keywords	Plate and shell, Static strength, Buckling and ultimate strength
	Phone: 092-802-3454 E-mail: yoshikawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-728	Course Requirements	It is required to understand the basics of material mechanics.
Outline	Learning of expert knowledge for strength evaluation related plate and shell structures for designing ships and offshore structures. (In Japanese)		

【船舶海洋振動学特論】

Code	M1652	Title	Advanced Course on Vibration of Marine Structures
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Yukitaka YASUZAWA	Keywords	Structural vibration, Modal analysis, Ship vibration
	Phone: 092-802-3455 E-mail: yasuzawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-729	Course Requirements	It is required to understand structural strength and fundamental vibration theory.
Outline	This lecture focuses on vibration theory and design and analysis method for marine structures.		

【海洋構造工学】

Code	M1653	Title	Structural Engineering of Marine Structures
Category	Advanced subject	**Activities**	Lecture
Period	1st (spring) term, 2nd year student	**Credit**	2
Instructor, Contact Information	Yukitaka YASUZAWA	**Keywords**	Hydroelasticity, Very large floating structure, Wave induced vibration
	Phone: 092-802-3455 E-mail: yasuzawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-729	**Course Requirements**	It is required to understand fundamental hydrodynamics and structural mechanics of marine structures.
Outline	This lecture focuses on structural design of marine structures and hydroelastic response of very large floating structures in waves.		

【船舶海洋計測工学】

Code	M1654	Title	Measurement Engineering of Marine Structures
Category	Advanced specialized subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Hiroyuki KAJIWARA	**Keywords**	Robot vision, QUEST algorithm
	Phone: 092-802-3441 E-mail: kajiwara@nams.kyushu-u.ac.jp Room: Ito Campus, W2-633	**Course Requirements**	None
Outline	This lecture focuses on robot-vision technologies for applications in the field of marine systems engineering.		

【船舶海洋情報学】

Code	M1655	Title	Information Technology for Ship and Marine Structures
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Hajime KIMURA	**Keywords**	Stochastic process, Information processing, Network technology
	Phone: 092-802-3452 E-mail: kimura@nams.kyushu-u.ac.jp Room: Ito Campus, W2-634	**Course Requirements**	None
Outline	This lecture focuses on stochastic modelling, information processing and network technology for application is in the field of marine systems..		

【荷重評価学】

Code	M1656	Title	Advanced Analysis of Extreme Environmental Loads
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Satoru YAMAGUCHI	Keywords	Environmental load, Load analysis
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735	Course Requirements	It requires fundamental knowledge of structure analysis, hydrodynamics and fracture mechanics.
Outline	This lecture focuses on analysis of extreme environmental loads for ship.		

【船舶海洋環境学】

Code	M1657	Title	Marine Environmental Systems Analysis
Category	Advanced subject	Activities	Lecture
Period	1st (spring) term, 2nd year student	Credit	2
Instructor, Contact Information	Satoru YAMAGUCHI	Keywords	Ocean, Climate change, Ocean observation, Ocean pollution
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735	Course Requirements	It requires fundamental knowledge about the ocean.
Outline	This lecture focuses on environmental systems of the ocean.		

【船舶用エンジン工学特論】

Code	M1658	Title	Advanced Course on Marine Engine Engineering
Category	Advanced specialized subject	Activities	Lecture
Period	1st (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Koji TAKASAKI	Keywords	Ship propulsion, Marine engine, Fuel, Environmental regulation
	Phone: 092-583-7591 E-mail: takasaki@ence.kyushu-u.ac.jp	Course Requirements	None
Outline	This lecture focuses on marine engine and countermeasure for environmental regulation.		

【材料･構造力学】

Code	M1679JB	Title	Materials and Structural Mechanics
Category	Advanced subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	4
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Strength of materials, Ship structural mechanics
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of strength of materials
Outline	This lecture focuses on materials and structural mechanics related to ships and offshore structures.		

【海洋流体構造連成力学】

Code	M1680JB	Title	Ocean Fluid-Structure Dynamics
Category	Advanced subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Fluid-structure interaction, dynamics
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of fluid mechanics and structural dynamics.
Outline	This lecture focuses on fluid-structure interaction in marine systems.		

【海洋再生可能エネルギー】

Code	M1682JB	Title	Ocean Renewable Energy
Category	Advanced specialized subject	**Activities**	Lecture
Period	2nd (fall) term, 1st year student	**Credit**	4
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Renewable energy, Wind energy, Marine energy
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of fluid mechanics and structural mechanics.
Outline	This lecture focuses on ocean renewable energy, such as offshore wind, wave energy, current/tidal energy, and ocean thermal energy conversion (OTEC).		

【ライザーとパイプライン】

Code	M1683JB	Title	Risers and Pipelines
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	4
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Risers, Pipelines, Offshore oil and gas
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of structural mechanics.
Outline	This lecture focuses on mechanics of risers and pipelines for offshore development.		

【サブシーシステム論】

Code	M1684JB	Title	Subsea Well Construction and Petroleum Production System
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	4
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Subsea systems, Petroleum production systems
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of fluid mechanics and structural mechanics.
Outline	This lecture focuses on subsea well construction and petroleum production system for development of deep sea oil and gas fields.		

【海洋環境工学】

Code	M1687JB	Title	Marine Environmental Engineering
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (spring) term, 1st year student	**Credit**	2
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	Environmental impact assessment, Ocean environment
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Basic understanding of marine environment
Outline	This lecture focuses on marine environmental engineering.		

【国際海洋開発フィールド演習】

Code	M1689JB	Title	International Field Practice for Ocean Development
Category	Academic and industrial liaison subject	**Activities**	Practice
Period	Full term, 1st year student	**Credit**	2
Instructor, Contact Information	Tomoaki UTSUNOMIYA	**Keywords**	International internship, Field practice
	Phone: 092-802-3447 E-mail: utsunomiya@nams.kyushu-u.ac.jp Room: Ito Campus, W2-629	**Course Requirements**	Communication ability in English
Outline	International field practice and/or internship longer than ten working days.		