Syllabus

2016

Global Course of
Department of Maritime Engineering

Graduate School of Engineering
Kyushu University

【海洋システム工学概論第 I】

Code	IM1611 / CL7	Title	Introduction of Marine Systems Engineering I (Naval Architecture and Marine Systems Engineering)
Category	Advanced subject	Activities	Lecture
Period	1st (fall) term, 1st year student	Credit	2
Instructor, Contact Information	Takao YOSHIKAWA (All professors in Department of Marine System Engineering)	Keywords	Control, Automatic piping, Manoeuvrability, Resistance and propulsion ,Fracture, Chaotic systems, Crashworthiness, Floating structures, Wind energy, Environmental risk
	Phone: 092-802-3454 E-mail: yoshikawa@nams.kyushu-u.ac.jp Room: Ito Campus, W2-728	Course Requirements	None
Outline	The following introductory lectures will be presented 1) Introduction to control technology、2) Automatic piping algorithm and valve operability optimization, 3) Ship manoeuvrability, 4) Crashworthiness of vehicle, 5) Structural design of very large floating structures, 6) Overview of fracture mechanics, 7) Introduction on offshore wind energy, 8) Ship resistance and propulsion, 9) Introduction of chaotic systems, 10) Marine environmental risk		

【海洋システム工学概論第 II】

Code	IM1612	Title	Introduction of Marine Systems Engineering II
Category	Advanced subject	Activities	Lecture
Period	2nd (spring) term, 1st year student	Credit	2
Instructor, Contact Information	Satoru YAMAGUCHI, Hajime KIMURA, Takashi TANAKA	Keywords	Ship design, Systems design, Chaotic system
	Phone: 092-802-3461 E-mail: yama@nams.kyushu-u.ac.jp Room: Ito Campus, W2-735 Phone: 092-802-3452 E-mail: kimura@nams.kyushu-u.ac.jp Room: Ito Campus, W2-634 Phone: 092-802-3458 E-mail: tanaka@nams.kyushu-u.ac.jp Room: Ito Campus, W2-732	Course Requirements	It requires fundamental knowledge for ships and offshore structures.
Outline	1) Ship preliminary design, 2) Systems design、3) Chaotic system		

【船舶海洋抵抗特論】

Code	IM1613	Title	Advanced Theory of Resistance for Ship and Marine Structures
Category	Advanced subject	Activities	Lecture
Period	2nd (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.		

【応用リスク解析学】

Code	IM1614	Title	Applied Risk Analysis
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (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.		

【応用数理学】

Code	IM1614	Title	Applied Mathematics for Design
Category	Advanced subject	Activities	Lecture
Period	2nd (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.		

【船舶基本設計特論】

Code	IM1616	Title	**Advanced Basic Design for Ships**
Category	Advanced subject	**Activities**	Lecture
Period	2nd (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.		

【破壊管理工学特論】

Code	IM1617	Title	**Advanced Course in Fracture Control Design**
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (fall) term, 1st year student	**Credit**	2
Instructor, Contact Information	Koji GOTOH	**Keywords**	Marine dynamics, Motion of floating body, Hydrodynamics
	Phone: 092-802-3457 E-mail: gotoh@nams.kyushu-u.ac.jp Room: Ito Campus, W2-731	**Course Requirements**	It is required to understand hydrodynamics and dynamics and control of ships.

Outline	Fundamental and practical application of fracture mechanics
	  1. Introduction, 2. Linear elastic fracture mechanics
	  3. Elastic-plastic fracture Mechanics, 4. Application to structures
	  5. Fatigue crack propagation, 6. Special lectures given by industrial experts (tentative)		

【構造安定論】

Code	IM1618	Title	**Continuum Mechanics II**
Category	Advanced specialized subject	**Activities**	Lecture
Period	1st (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)		

【船舶運動特論】

Code	IM1619	Title	Advanced Course of Dynamics of Ships
Category	Advanced specialized subject	Activities	Lecture
Period	1st (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.		

【制御工学特論】

Code	IM1620	Title	Advanced Course of Control Engineering
Category	Advanced specialized subject	Activities	Lecture
Period	2nd (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	IM1621	Title	Application of Energy from the Ocean
Category	Advanced specialized subject	Activities	Lecture
Period	1st (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.		

【船舶海洋振動学特論】

Code	IM1622	Title	Advanced Course on Vibration of Marine Structures
Category	Advanced specialized subject	Activities	Lecture
Period	1st (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.		

【システム設計特論】

Code	IM1623	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.		