Course Syllabus

1. Class Information

- **Class Title**: Naval Architectural Calculation
- **Class Number**: 414.261 (3 Credits)
- **Semester**: Spring, 2018
- **Level of Course**: Undergraduate / Sophomore
- **Class Time**: Tue. 11:00 a.m -12:15 p.m., Thu. 11:00 a.m. -12:15 p.m.
- **Location**: Room 211, Bldg. 36
- **Instructor**: Prof. Myung-Il Roh
  Office: Room 308D, Bldg. 36
  E-mail: miroh@snu.ac.kr
  Phone: (02)-880-7328
  Office Hours: Available before school and after school by appointment.
- **Teaching assistants**: Joon-Bum Lee, Ji-Sang Ha
  E-Mail: ljb9601@snu.ac.kr, ericx5@snu.ac.kr
  Office: Room 206, Bldg. 36
  Phone: (02)-880-8378
- **Language of Instruction**: Korean

2. Course Topics and Description

The course deals with ‘Ship Stability’ in ocean environment

1) Based on the fluid mechanics, position and orientation of a ship in calm water such as immersion, heel, and trim are introduced.
2) Then the students learn how to evaluate the required intact and damage stability of IMO regulations.
3) Also students have to work two term projects to find the equilibrium position and to calculate the hydrostatic values of a floating body.

Term Project 1: Development of a program for finding the equilibrium position and plotting statistical stability curve of a barge
Term Project 2: Development of a program for generating hydrostatic tables and plotting hydrostatic curves after calculating hydrostatic values for the given offsets table of a ship or an offshore structure

3. Textbook and Reference

(1) Textbook

- Roh, Myung-Il, Ship Stability, Lecture Note for Naval Architectural Calculation, Seoul National University, Spring, 2018

(2) Reference

- 대한조선학회, "선박계산", 텍스트북스, 2012.11
- Roh, Myung-Il, Lee, Kyu-Yeul, Computational Ship Design, Springer, 2018
- Letcher, John S., "The Principles of Naval Architecture: The Geometry of Ships", SNAME, 2009
- Moore, Colin S., "The Principles of Naval Architecture: Intact Stability", SNAME, 2010

4. Grade Computation

Weighted system is as follows:

- Two Exams: 50%
- Two Term Projects: 40%
- Attendance: 10%

No attendance in any exam and no submission of any term project will result in F grade.

5. Website: http://etl.snu.ac.kr

Most assignments and instructions will be made only on the website, so check it frequently.

6. Class Expectation

- Late work will be not accepted.
- Show respect to others and their property.
- Come prepared to class.
- It is required to make appointments to see instructor during office hours. Send email for an appointment at least one day in advance.
- No cell phone on the desk.

7. Exam Schedule

	Mid-term Exam	Final Exam
Date	April 26th, 2018 (Thursday), 11:00~12:15	June 14th, 2018 (Thursday), 11:00~12:15
Range of Exam	- Restoring force and moment - Hydrostatic pressure, and buoyant force on a floating body - Transverse stability due to cargo movement - Initial transverse stability - Initial longitudinal stability - Free surface effect - Inclining test - Curves of stability and stability criteria	- Numerical integration method in naval architecture - Hydrostatic values and curves - Static equilibrium state after flooding due to damage - Deterministic damage stability - Probabilistic damage stability

8. Course Schedule

Week	Regular Lecture				Term Project
	Tuesday		Thursday		
	Date	Time: 11:00-12:15	Date	Time: 14:00-15:15	
1	03/06	Introduction to Ship Stability, Restoring Force and Moment	03/08	Hydrostatic Pressure, and Buoyant Force on a Floating Body (1)	**Term Project 1** - Due date: **23:00, May 7 (Mon)** **Term Project 2** - Due date: **23:00, June 4 (Mon)**
2	03/13	Hydrostatic Pressure, and Buoyant Force on a Floating Body (2)	03/15	Transverse Stability Due to Cargo Movement (1)	
3	03/20	Transverse Stability Due to Cargo Movement (2)	03/22	Transverse Stability Due to Cargo Movement (3)	
4	03/27	Initial Transverse Stability (4)	03/29	Initial Transverse Stability (1)	
5	04/03	Initial Transverse Stability (2)	04/05	Initial Longitudinal Stability (1)	
6	04/10	Initial Longitudinal Stability (2)	04/12	Free Surface Effect	
7	04/17	Inclining Test	04/19	Curves of Stability and Stability Criteria (1)	
8	04/24	Curves of Stability and Stability Criteria (2)	04/26	**Mid-term Exam**	
9	05/01	Numerical Integration Method in Naval Architecture (1)	05/03	Numerical Integration Method in Naval Architecture (2)	
10	05/08	Numerical Integration Method in Naval Architecture (3)	05/10	Hydrostatic Values and Curves (1)	
11	05/15	Hydrostatic Values and Curves (2)	05/17	Static Equilibrium State after Flooding Due to Damage	
12	05/22	**Holiday**	05/24	Deterministic Damage Stability (1)	
13	05/29	Deterministic Damage Stability (2)	05/31	Deterministic Damage Stability (3)	
14	06/05	Probabilistic Damage Stability (1)	06/07	Probabilistic Damage Stability (2)	
15	06/12	Probabilistic Damage Stability (3)	06/14	**Final Exam**	