Course Syllabus

1. Class Information

- **Class**: Innovative Ship and Offshore Plant Design
- **Class Number**: 414.462
- **Semester**: Spring 2016
- **Level of Course**: Undergraduate / Senior
- **Time**: Tue. 14:00-15:15 p.m., Thu. 14:00-15:15 p.m.
- **Location**: Room 106, 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**: Seung-Min Lee, Hye-Won Lee
  E-Mail: digimin100@snu.ac.kr, gpdnjs0215@snu.ac.kr
  Office: Room 206, Bldg. 36
  Phone: (02) 880-8378

2. Course Topics and Description

This course present a method for basic design of ship and offshore plant. Owner's requirements, determination of principal dimensions, determination of main engine and propeller, hull form design, general arrangement design, structural design, outfitting design, and so on are presented, and application examples to actual ships are also presented to maximize understanding of students. In addition, students perform a term project of basic design of actual ship or offshore plant. Through this course, the students will learn a basis for creative design method of ship and offshore plant and a basis for design method of creative ship and offshore plant in the future.

(1) Procedures and methods of the basic design of ship: Determination of ship's principal dimensions, Estimation of weight, Estimation of cargo hold volume, Calculation of freeboard, Prediction of resistance, speed, and power, Determination of propeller's principal dimensions, Selection of main engine, Hull form design by hull form variation method, General arrangement design, Structural design, Outfitting design

(2) Procedures and methods of the basic design of offshore plant: Overview of topsides process FEED (Front-End Engineering Design) of offshore plant, Determination of operating conditions of topsides system, Weight estimation of topsides system, Topsides layout

(3) Term project: Students have to work in team, consisting of 4 to 5 students, on two term projects for given owner's requirements. **The 1st term project** is a **conceptual design** of a commercial ship based on the given basis ship and is obligatory for all students. After completing the conceptual design, students can then either join the **"Ship Design Contest (Free Theme)"** or continue their 1st term project and start the 2nd term project handling the **basic design** of the commercial ship. The teams who are participating in the ship design contest will be favored in their grading.

3. Term Projects Description

(1) Projects Description

① 1st Term Project

- Due date: **April, 18th (Mon), 23:00**
- Presentation of 1st term project**: April, 19th (Tue), 14:00~15:15**
- **"Initial design of a commercial ship** based on the given basis ship" including the determination of principal dimensions, performance calculation, hull form design, and general arrangement design

② 2nd Term Project

- Due date: **June, 6th (Mon), 23:00**
- Presentation of 2nd term project: **June, 7th (Tue), 14:00~15:15**
- "**Basic design of the commercial ship"** including the final hull form design, final general arrangement design, trim & stability calculation, and structural design (midship scantling).

or

- "**Participation of the ship design contest"** organized by the Society of Naval Architects of Korea. Teams who are participating in the ship design contest will be favored in their grading.

(2) Work Scope

① Group A: Students who participate in the ship design contest.

- Work Scope: **Conceptual design** of a commercial ship (1st term project)
- **Ship Design Contest**

② Group B: Students who do not participate in the ship design contest.

- Work Scope: All contents of the 1st and 2nd term project

4. Textbook and References

(1) Textbook

- Roh, Myung-Il, "Innovative Ship and Offshore Plant Design" in English, Seoul National University, Spring 2016.

(2) References

- Parson, M. G., NA470 Ship Design & NA570 Advanced Marine Design,
- Schneekluth, H. & Bertram, V., Ship Design for Efficiency and Economy, 2nd Edition, Butterworth-Heinemann 1998.

5. Grade Computation

Weighted system is as follows:

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

In case of an excused absence, the student must make-up any missed test, quiz or homework the following day during a free period, before or after school. Unexcused absences will result in a zero.

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

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

7. 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.

8. Exam

	Mid Exam	**Final Exam**
Date	April 21st, 2016 (Thursday), 14:00~15:15	June 9th, 2016 (Thursday), 14:00~15:15
Range of Exam	Determination of Ship's Principal Dimensions	(1) Ship Design: Hull Form Design, General Arrangement Design, Structural Design, Outfitting Design (2) Offshore Plant Design

9. Course Schedule

Week	Course Schedule			
	Tuesday		Thursday	
	Date	Time: 14:00-15:15	Date	Time: 14:00-15:15
1	03/01	-	03/03	Introduction to Ship Design
2	03/08	Introduction to Offshore Plant Design	03/10	Owner's Requirements, Design Equations
3	03/15	Buoyancy and Static Equilibrium, Hydrostatic Pressure, Force and Moment on a Floating Body	03/17	Weight Equations, Volume Equations (1)
4	03/22	Weight Equations, Volume Equations (2)	03/24	Freeboard Calculation
5	03/29	Resistance and Propulsion Power Estimation (1)	03/31	Resistance and Propulsion Power Estimation (2)
6	04/05	**Holiday**	04/07	Main Engine Selection
7	04/12	Propeller Selection (1)	04/14	Propeller Selection (2)
8	04/19	**Presentation of 1st Term Project**	04/21	**Mid Exam**
9	04/26	Hull Form Design (1)	04/28	Hull Form Design (2)
10	05/03	General Arrangement Design (1)	05/05	**Holiday**
11	05/10	General Arrangement Design (2)	05/12	Structural Design (1)
12	05/17	Structural Design (2)	05/19	Outfitting Design
13	05/24	Example of Ship Design (1)	05/26	Example of Ship Design (2)
14	05/31	Example of Offshore Plant Design (1)	06/02	Example of Offshore Plant Design (2)
15	06/07	**Presentation of 2nd Term Project**	06/09	**Final Exam**