

Syllabus

Class: Topics in ship design automation

Semester: fall 2010

Time: Mon. 15:30-17:00 p.m., Wed. 15:30-17:00 p.m.

Location: Room 117, Bldg. 34

Instructor: Prof. Kyu-Yeul Lee

Office: Room 208, Bldg. 34

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Phone: (02)-880-7327

Office Hours: Available before school and after school by appointment

Course Topics and Description:

The course is intended for graduates from engineering backgrounds. The main goals of this class are to give students solid foundation for understanding kinematics of 3 dimensional object motion and how the mathematical models of multi-body dynamics problems are derived from physical and mathematical principles by Newtonian mechanics.

Prerequisites are a minimum of Engineering Mathematics and Dynamics.

The course consists of four parts.

Part I: Kinematics - Kinematics of Underwater Vehicles.

Part II : Dynamics of a Rigid Body - Dynamics of Underwater Vehicles.

Part III : Multibody Dynamics - Dynamic Analysis of Wind Turbine on a Barge Type Platform.

Part IV: Dynamics of Deformable Body - Dynamic analysis of Wind Turbine with Elastic Blade on a Barge Type Platform.

Schedule

WEEK #	TOPICS
1	Part I - Kinematics - Frame, Position Vector, Velocity Vector and Force Vector(1)(Textbook #2, Ch.1)
2	Part I - Kinematics - Frame, Position Vector, Velocity Vector and Force Vector(2)(Textbook #2, Ch.1), 3 Dimensional Rotation(1)
3	Part I - Kinematics - 3 Dimensional Rotation(2)(Textbook #2, Ch.3) ☞ Kinematics of Underwater Vehicles
4	Part I - Kinematics - Articulated Figure, Forward and Inverse Kinematics (Textbook #1, Ch.2, 3)
5	Part II - Dynamics of a Rigid Body - Dynamics of a Particle(Textbook #2, Ch.5)
6	Part II - Dynamics of a Rigid Body - Inertial Effects for a Rigid Body(Textbook #2, Ch.5)
7	Part II - Dynamics of a Rigid Body - Newton-Euler Equations of Motion(Textbook #2, Ch.5) ☞ Dynamics of Underwater Vehicles
8	Part III - Multibody Dynamics - Penalty Based Multibody Dynamics(Textbook #1, Ch.5)
9	Part III - Multibody Dynamics - Impulse-Based Multibody Dynamics(Textbook #1, Ch.6)
10	Part III - Multibody Dynamics - Constraint-Based Multibody Dynamics(1)(Textbook #1, Ch.7)
11	Part III - Multibody Dynamics - Constraint-Based Multibody Dynamics(2)(Textbook #1, Ch.7) ☞ Dynamic Analysis of Wind Turbine on a Barge Type Platform
12	Part IV: Dynamics of Deformable Body - Dynamics of a Deformable Object - Particle Systems(Textbook #1, Ch.7)
13	Part IV: Dynamics of Deformable Body - Continuum Models with Finite Differences(Textbook #1, Ch.9)
14	Part IV: Dynamics of Deformable Body - The Finite Element Method(1)(Textbook #1, Ch.10)
15	Part IV: Dynamics of Deformable Body - The Finite Element Method(2)(Textbook #1, Ch.10) ☞ Dynamic analysis of Wind Turbine with Elastic Blade on a Barge Type Platform.

Textbook :

- #1 "Physics-Based Animation", Erleben, K., Sporring, J., Henriksen, K., Dohlmann, H., Charles River Media, 2005
- #2 "Engineering Dynamics", J., Ginsberg, Cambridge University Press, 2008

Grading: Weighted system as follows

Midterm Exam : 20%

Final Exam : 20%

Assignment: 50%

Attendance: 10%

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: 59 and below

Website: <http://asdal.snu.ac.kr>

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

Class Expectations:

- Late work will not be accepted
- Show respect for others and their property
- Come to class prepared
- Required to make appointments to see instructor during office hours. Send email for an appointment at least one day in advance.