AMGS Cross Mentoring Research Activity 2018-2019 - Research Syllabus

Ⅰ. Mentor

1. Personal Information

Name	Hakjin Lee
Mobile Number	+82-10-4632-7055
School or Institute	Korea Advanced Institute of Science and Technology (KAIST)
E-mail	hakjin@kaist.ac.kr
Major	Aerospace Engineering, Wind turbine aerodynamics, Wind turbine wake, Design optimization

2. Education

	Year	Name of University	Major	Degree	Nation
Bachelor's degree	2012	Korea Aerospace University	Aerospace Engineering	B.S.	Korea
Master's degree	2014	KAIST	Aerospace Engineering	M.S.	Korea
Doctorate	2019	KAIST	Aerospace Engineering	Ph.D.	Korea
Dissertation	Development of Nonlinear Vortex Lattice Method for Predicting Wind Turbine Performance and Wake Structures				

3. Experiences

Duration	Position	Institute or University
2014	Teaching Assistant	Korea Science Academy (KSA) of KAIST
2015	Teaching Assistant	Korea Science Academy (KSA) of KAIST
2018	Teaching Assistant	Korea Science Academy (KSA) of KAIST

4. Honors and Awards

Year	Title	Remarks

5. Professional Societies

Ⅱ. Syllabus

1. Course Title & Criteria

Course Title	
Criteria	[ ] Biology & Applied Biology
	[ ] Chemistry
	[ ] Energy & Environmental Science
	[ ] Integrated Science
	[ ] Medicinal Science
	[ ] Nano Science
	[ ] Physics
	[X] Others

2. Course Objectives & Description

- The goal of this course is to provide students with a fundamental aerodynamics and the detailed flow physics regarding wind turbine system. At the end of this course, students will be able to learn how to establish a research plan for studying practical engineering problems which are mainly associated with wind turbine topics.

3. Required Textbook or papers

- Hansen, M. O. L., Aerodynamics of Wind Turbine, 2nd edition, Earthscan, 2013.
- Leishman, J. G., Principles of Helicopter Aerodynamics, 2nd edition, Cambridge, 2006.

4. Final Outcome

Mid-term Report	[ ] Due date:
Final Report	[ ] Due date:
Research Article for APEC Youth Scientist Journal	[X] Due date: March 1, 2019

5. Schedule

Week	Topics and Activities	Assignments & Other Instructions
Week 1	General introduction to wind turbines	Assignments
Week 2	Two-dimensional Aerodynamics	Assignments
Week 3	Three-dimensional Aerodynamics	Assignments
Week 4	Blade Element Momentum (BEM) theory	Assignments
Week 5	Unsteady aerodynamics	Assignments
Week 6	Control and regulation systems	Assignments
Week 7	Optimization	Assignments
Week 8	Further topic for wind turbines	Assignments
Week 9	Guide mentees to write research articles for the Journal	Literature survey
Week 10	Guide mentees to write research articles for the Journal	Literature survey
Week 11	Guide mentees to write research articles for the Journal	Literature survey
Week 12	Guide mentees to write research articles for the Journal	Literature survey
	Mentee should submit their research article to AMGS admin team	