

On-line gPBL (HUST-ITB-TNI-SIT) Plan 2021

May 17th, 2021 Goro Fujita (SIT)

<1> Title:

Power system control training

<2> Outline:

Providing electricity is quite important to sustain modern society. In order to realize high quality electricity reliability, sophisticated generator control is required so that stable frequency and voltage are maintained. This PBL provides opportunity to understand how to control generator with learning control theory. In beginning, students at each university learn control theory using a kit. After understanding the control theory, students try to design generator controller to maintain good power quality. The experiment is performed at SIT so the deep discussion and role assignment is necessary that will foster the following description.

<3> Description:

PBL is "Problem Based Learning" or "Project Based Learning", which is a training to collaboratively solve a problem with other members in a group. Through the experience of discussion with students from overseas, this PBL provides the opportunity to acquire

- ability to communicate information and opinion,
- ability to understand information and opinion of other persons,
- leadership

which are required for global engineers.

<4> Attendee:

HUST (Vietnam): Dr. Nguyen Duc Tuyen (lecturer, Adjunct Assoc.Prof of SIT), 2-4 students

ITB (Indonesia): Dr. Pradita Octoviandiningrum Hadi (lecturer), 2-4 students

TNI (Thailand): Dr. Jirada Gosumbonggot (lecturer), 2-4 students

SIT (Japan): Dr. Goro Fujita (Professor, main organizer), 4-6 students (B3: 2-4, B4 or greater: a few)

<5> Method:

- (1) HUST, ITB, and TNI send the list of attendee to SIT to become short visiting students of SIT by end of August, official acceptance will be notified.
- (2) SIT register attendee from HUST and ITB as short-term foreign students, issue ID.
- (3) SIT send the following kit and text book to HUST and ITB (one kit to 2 students and one text book to each students).
- (4) Students in each university attend the class staying at home country using
 - ✓ Kit: 'Control System Design : Getting Started with Arduino and MATLAB -Experimental Kit' (Physical Computing Lab, Japan)
 - ✓ Text book: 'Control System Design: Getting Started with Arduino and MATLAB' (Physical Computing Lab, Japan)
 - ✓ Software: Matlab/Simulink (license available after registering as a SIT students)
- (5) The class is organized with weekly on-line meeting to report the progress for 2 months.
- (6) After 2 months, students will understand control theory, including design of controller.
- (7) At 3rd month, target is changed to a generator, SIT provides specification, HUST and ITB design the controller.
- (8) Experiment test is held at SIT, HUST and ITB order to apply the proposed control and attend the experiments by on-line.
- (9) At the end of 3rd month, final presentation is held to report the progress, evaluation is given based on the public.
- (10) SIT will issue certificate. Each home university may issue appropriate credit.

<6> Term:

October – December, 2021

<7> Expense:

No expense except for PC and internet commutation network.

<8> Credits

This program is scheduled to use 48 hours, detail is explained in next chapter. Each university may issue appropriate credits for students.

<9> Schedule regarding credit issue

No.	Contents	On-line class	Face-face class	self-learning	total
1	Kichoff	1	1	1	3
2	Control theory (1)	1	1	3	5
3	Control theory (2)	1	1	3	5
4	Control theory (3)	1	1	3	5
5	Control theory (4)	1	1	3	5
6	Generator control (1)	1	1	3	5
7	Generator control (2)	1	1	3	5
8	Generator control (3)	1	1	3	5
9	Generator control (4)	1	1	3	5
10	Final Report	1	1	3	5
total		10	10	28	48

Rubric

Terms	Excellent (Fully satisfying the requirement)	Good (Mostly satisfying the requirement)	Fine (Fairly satisfying the requirement)	Fair (Requirement is partially satisfied)	Poor (Requirement is not completely satisfied)
Technical skill	5	4	3	2	1
Mathematical skill	5	4	3	2	1
Data analysis	5	4	3	2	1
Presentation skill	5	4	3	2	1
Communication	5	4	3	2	1

Each university staff put score for each students then take average.