

THE TWINNING PROGRAM BETWEEN  
NAGAOKA UNIVERSITY OF TECHNOLOGY  
AND  
HOCHIMINH CITY UNIVERSITY OF  
TECHNOLOGY

- How do Intensive Lectures work? -

Yoshinori Takei

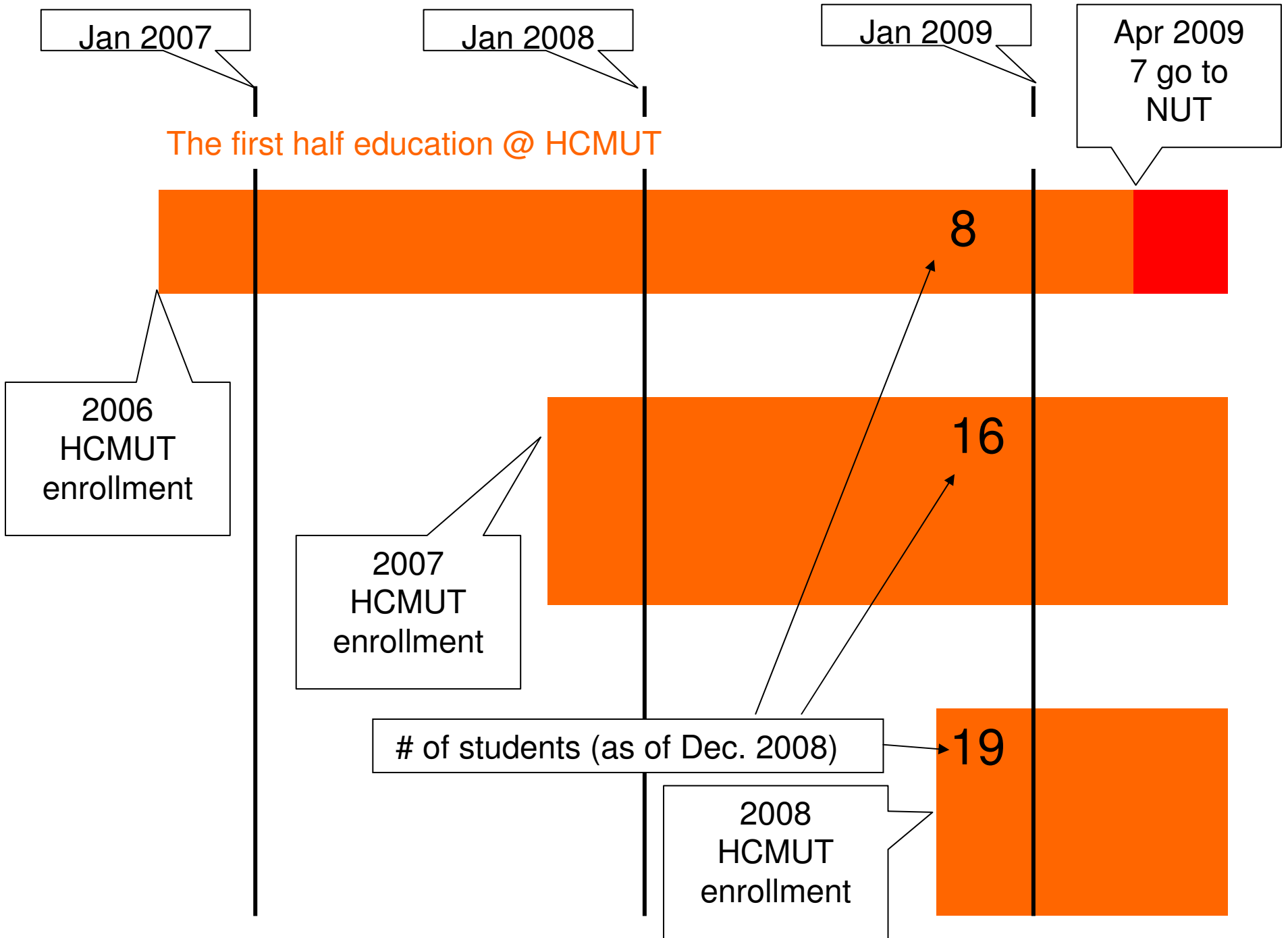
Department Electrical Engineering  
Nagaoka University of Technology

# NUT-HCMUT Twinning Program(2006-)

- Started as a program between  
Dept. Electrical Eng. and Fac. Electrical & Electronics  
(have 3 courses  
Energy Syst., Optical & Electronic Devices, and  
Information & Communication Tech.)
- Electrical Engineering requires...
  - Electromagnetism
  - Circuit Theory
  - Physics
  - Mathematics
  - ... many backgrounds
- Fortunately, 2 curricula are highly compatible

## Compatibility of the first half education

NUT subjects	NUT Credits	HCMUT subjects	Corresponding Credits	HCMUT Credits
Mathematics 1A	2	Mathematics 1	2	2
Exercise in Mathematics 1	1	Mathematics 2	1	3
Mathematics 1B	2	Mathematics 2	2	3
Physics 1	2	Physics 1	2	3
Theory and Practice of Electromagnetism 1	3	Electromagnetic field	3	3
Theory and Practice of Electromagnetism 2	3	Electrical Engineering 1	2	3
		Exercise in Electromagnetism	1	1
Theory and Practice of Electric Circuit 1	3	Electric Circuit 1	3	3
Theory and Practice of Electric Circuit 2	3	Electric Circuit 2	3	3
Fundamental Information Processing Exercise	2	Information 1	2	3
Physics Laboratory and Exercise 1	2	Physics 1	1	3
		Physics Lab	1	1
Physics Laboratory and Exercise 2	2	Physics 2	2	2
Basic Engineering in Experiment	2	Circuit Lab	1	1
		Electronic Workshop C	1	1
Fundamental Experiments of Electrical Engineering	2	Experimentation in Electronic circuits	1	1
		Experiments for course "Electronic components and Semiconductor"	1	1



Jan 2007

Jan 2008

Jan 2009

Apr 2009  
7 go to  
NUT

The first half education @ HCMUT

8

2006  
HCMUT  
enrollment

2007  
HCMUT  
enrollment

16

# of students (as of Dec. 2008)

2008  
HCMUT  
enrollment

19

The latter half education

Engineering Subjects in Japanese

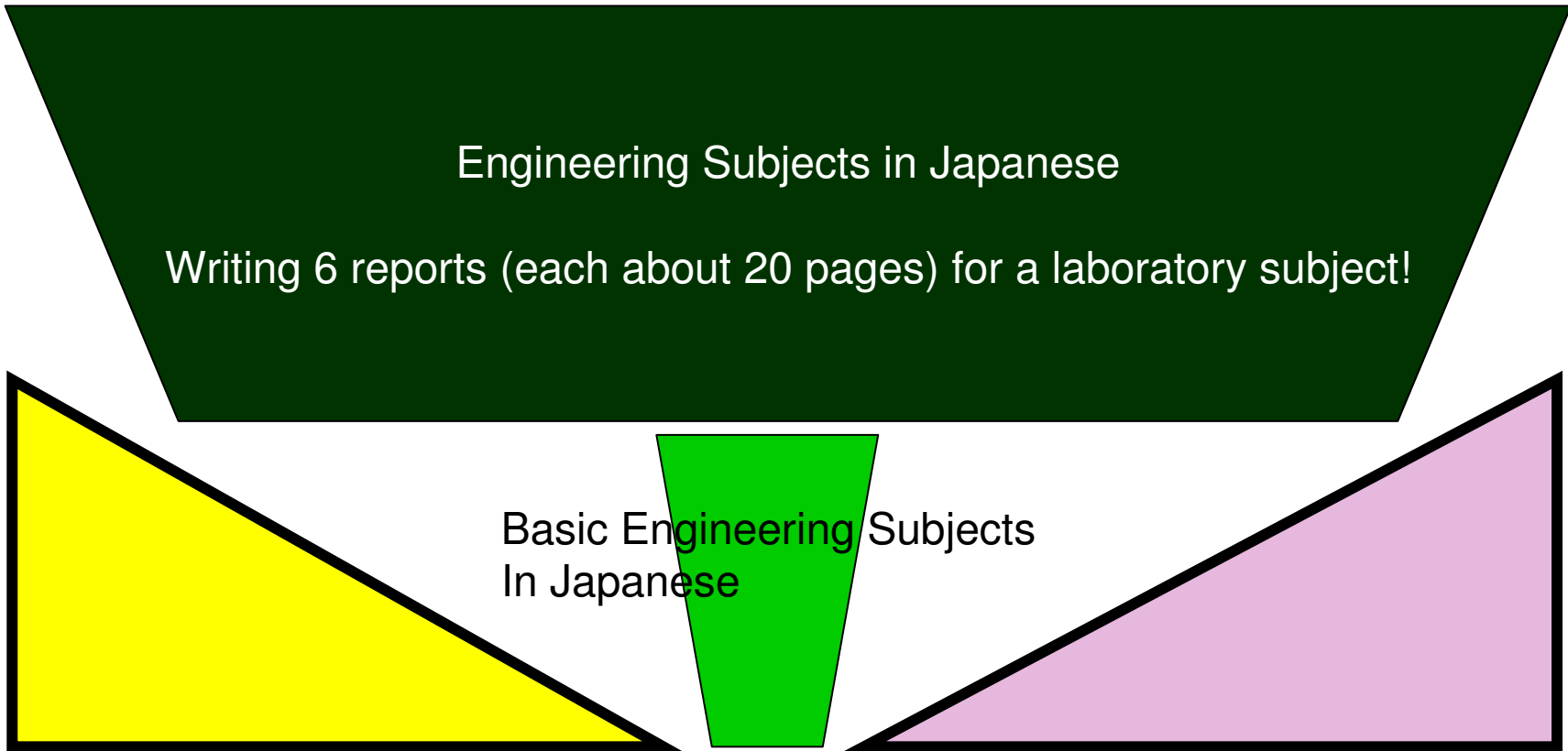
Writing 6 reports (each about 20 pages) for a laboratory subject!

Basic Engineering Subjects  
In Japanese

Basic Engineering Subjects  
In Vietnamese

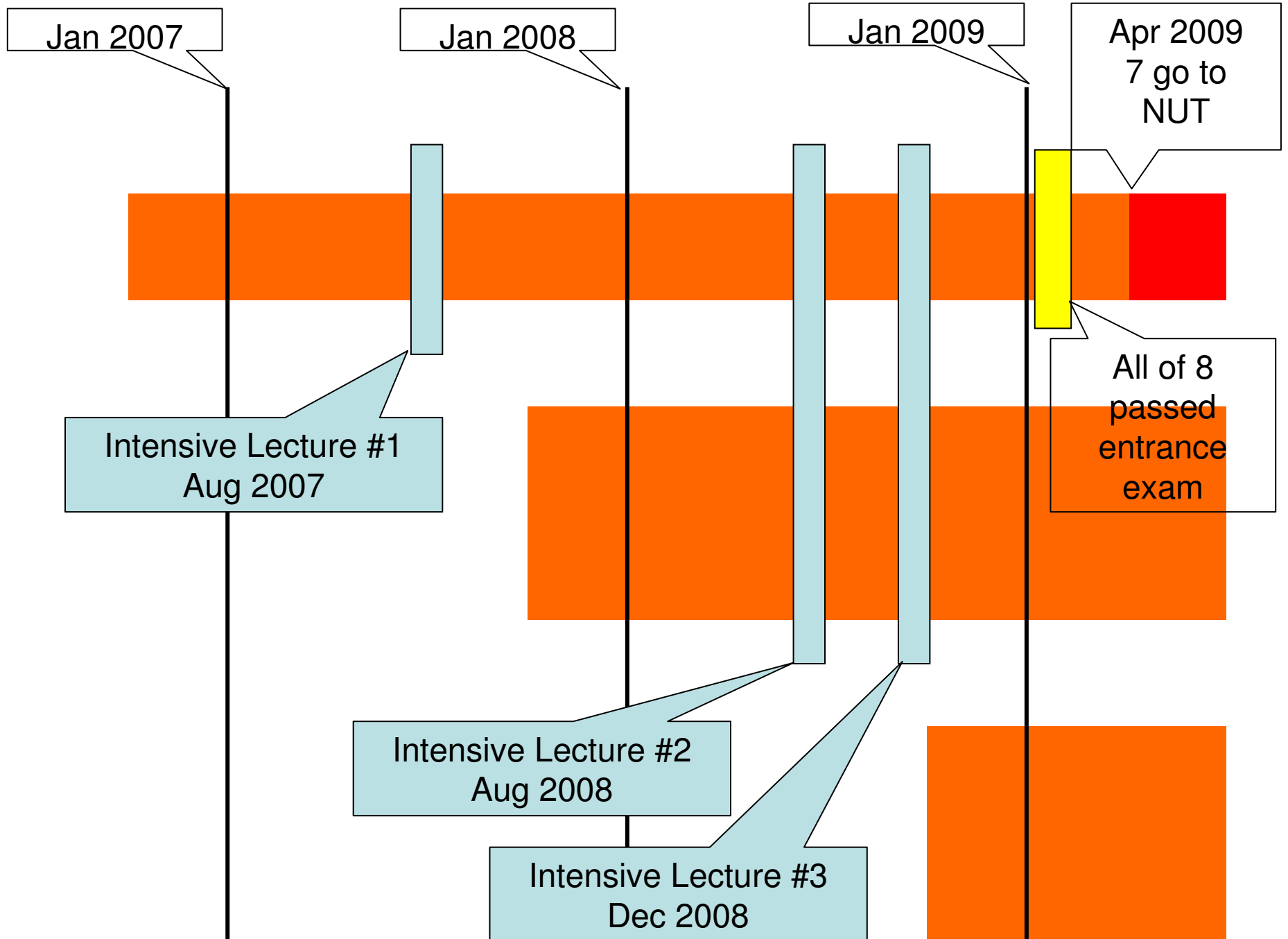
Japanese Classes

The first half education



# Basic Engineering Subjects in Japanese

- Regular Courses @ HCMUT
  - Technical Japanese, Prof. Tung
- Intensive Courses by NUT DEE Staffs
  - Students want to know how their latter half education will be
  - NUT Teachers want to know
    - What students do well
    - What students feel difficulty



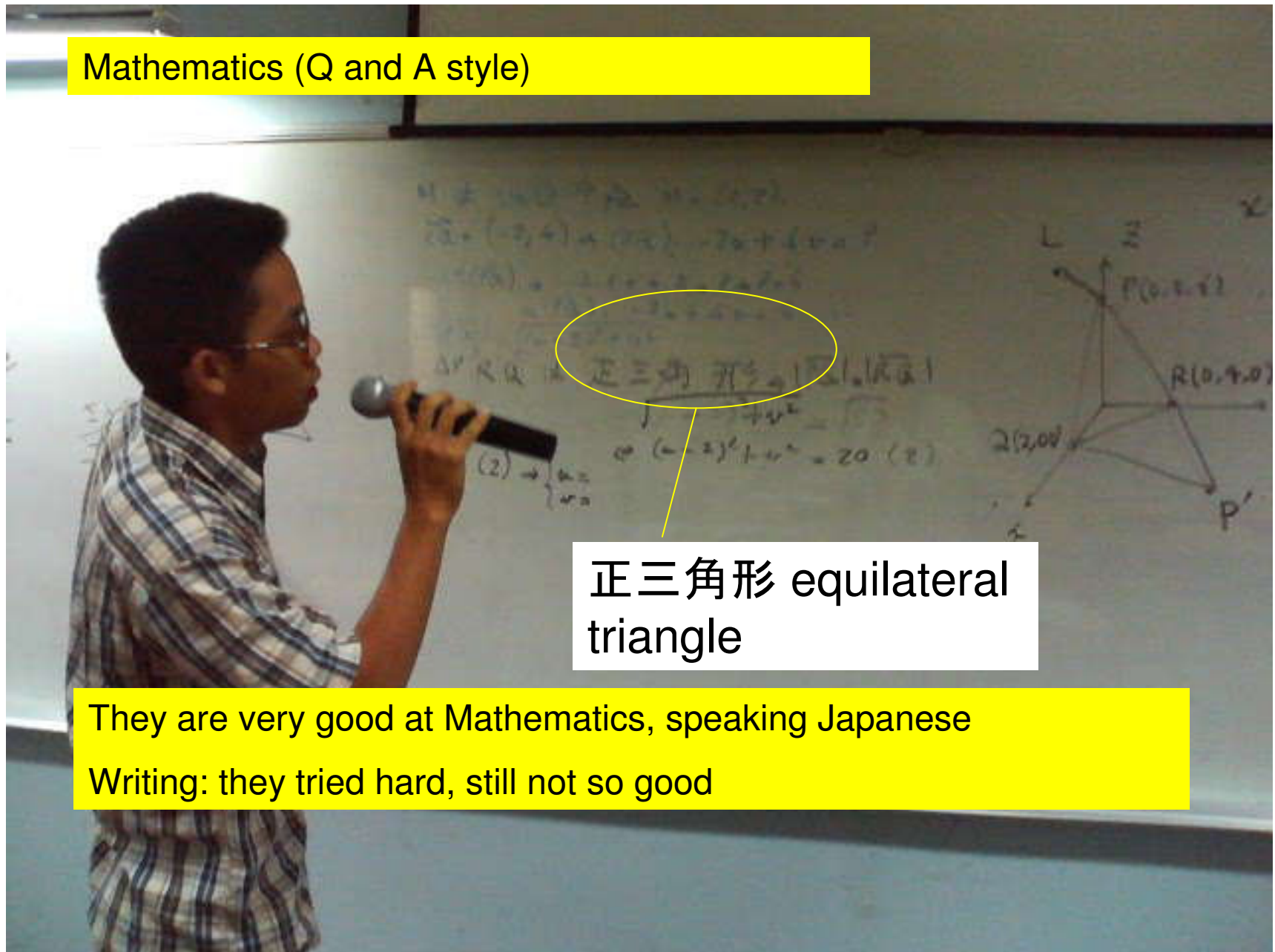
# Intensive Course #1 (Aug 25-31, 2007)

- Mathematics (18hours, Takei)
- Physics (6hours, Takei )
- Electrical Circuits (6hours, Prof. Furuya)
- Electromagnetism (6hours, Prof. Furuya)

V ↔ J ↔ E Dictionary



Mathematics (Q and A style)



正三角形 equilateral triangle

They are very good at Mathematics, speaking Japanese  
Writing: they tried hard, still not so good

Ruby characters are essential, without them searching for the word through dictionary is not easy

問題 6 :

$f(x) = e^{-x}$  とおくと、 $f'(t) = -e^{-t}$  であるから、

接線  $l$  の方程式は、 $l: y = -e^{-t}(x-t) + e^{-t}$  である。

(1)  $l$  と  $x$  軸の交点の  $x$  座標は、つまり  $x$  切片は、 $0 = -e^{-t}(x-t) + e^{-t}$  より  $x = t+1$ .

これが正になる条件は  $t > -1$ .

(2)  $l$  の  $y$  切片は、 $\dots e^{-t} > 0$  であるから、 $S(t) = \frac{(t+1)e^{-t}}{2}$ 。

(3)  $S(-1) = 0$ 、 $\lim_{t \rightarrow \infty} S(t) = 0$ 、であり、 $S'(t) = \frac{1}{2}(e^{-t} - (t+1)e^{-t}) = \frac{-te^{-t}}{2}$  の符号は  $t < 0$  で正、 $t > 0$

で負、 $S'(0) = 0$  だから  $S(t)$  は  $t = 0$  に唯一の極大値を持ち、それが  $S(t)$  の最大値を与える。

従って、 $S(t)$  の最大値は  $S(0) = \frac{1}{2}$ 。

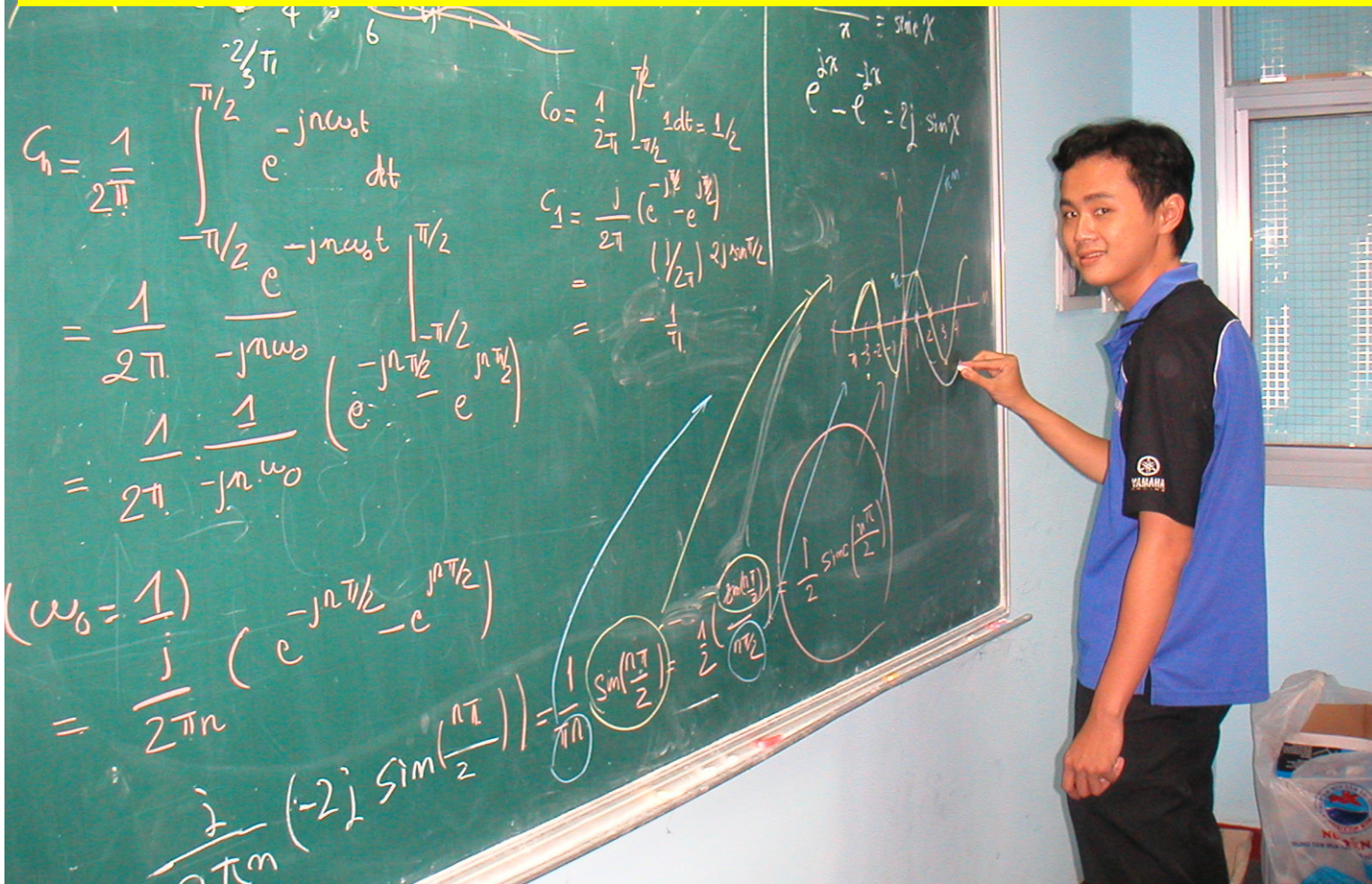


## Intensive Course #2(Aug 3-5, 2008)

- Digital Signal Processing  
(2<sup>nd</sup> year Students, 9hrs, Prof. Iwahashi)
- Control Engineering  
(2<sup>nd</sup> year Students, 9hrs, Prof. Itoh)
- Linear Algebra  
(1<sup>st</sup> year Students, 9hrs, Prof. Iwahashi)
- Electrical Circuits  
(1<sup>st</sup> year Students, 9hrs, Prof. Itoh)

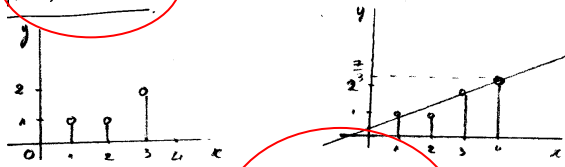
# Digital Signal Processing (2<sup>nd</sup> year students)

Great ability of logical thinking / finding solutions



問題 2:

Japanese (kanji)



i)  $y = h_0 + h_1 x$   $\forall x$   
 $h_0, h_1: y|x=4$   $\forall x$   
 ii)  $y = h_0 + h_1 x + h_2 x^2$   $\forall x$   
 $y|x=4 = ?$

Japanese (hiragana)

$$* E = \sum_{n=1}^N (z_n - y_n)^2$$

$$= \sum_{n=1}^N (h_1 n + h_0 - y_n)^2$$

$$E \rightarrow \min_{h_0, h_1}$$

$$\Rightarrow \begin{cases} \frac{\partial E}{\partial h_0} = 2 \sum_{n=1}^N (h_1 n + h_0 - y_n) \cdot 1 = 0 \\ \frac{\partial E}{\partial h_1} = 2 \sum_{n=1}^N (h_1 n + h_0 - y_n) \cdot n = 0 \end{cases}$$

$$= \begin{cases} h_1 \sum_{n=1}^N n + h_0 \sum_{n=1}^N 1 = \sum_{n=1}^N y_n \\ h_1 \sum_{n=1}^N n^2 + h_0 \sum_{n=1}^N n = \sum_{n=1}^N n y_n \end{cases}$$

$$\Rightarrow \begin{pmatrix} \sum_{n=1}^N n & \sum_{n=1}^N 1 \\ \sum_{n=1}^N n^2 & \sum_{n=1}^N n \end{pmatrix} \begin{pmatrix} h_0 \\ h_1 \end{pmatrix} = \begin{pmatrix} \sum_{n=1}^N y_n \\ \sum_{n=1}^N n y_n \end{pmatrix}$$

$$\Rightarrow \text{i)}: \begin{pmatrix} 3 & 6 \\ 6 & 14 \end{pmatrix} \begin{pmatrix} h_0 \\ h_1 \end{pmatrix} = \begin{pmatrix} 4 \\ 9 \end{pmatrix}$$

$$\begin{pmatrix} h_0 \\ h_1 \end{pmatrix} = \begin{pmatrix} 1/3 \\ 1/2 \end{pmatrix}$$

$$\Rightarrow y = \frac{1}{2}x + \frac{1}{3}; h_0 = \frac{1}{3}; h_1 = \frac{1}{2}$$

$$\Rightarrow y|x=4 = \frac{7}{3}$$

Linear Algebra (1<sup>st</sup> year students)

Homework

They are very strong at mathematics



## Intensive Course #3(Nov 8-11, 2008)

- Electronics and Optics  
(2<sup>nd</sup> year Students, 15hrs, Prof. Okamoto)
- Fundamentals of -----  
(1<sup>st</sup> year Students, 5hrs, Prof. Okamoto)

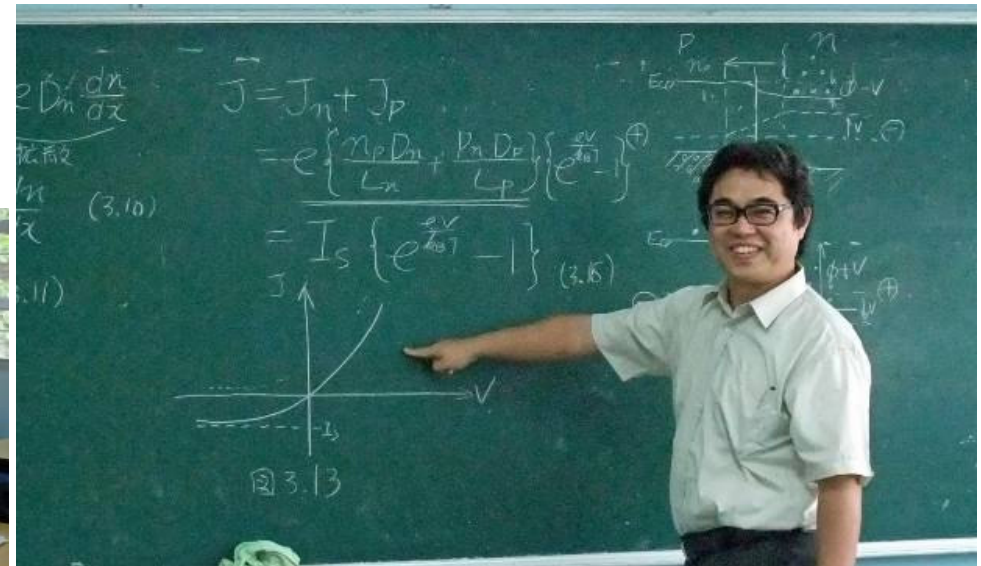


2<sup>nd</sup> year students

Tech terms were pronounced slowly

2/3 speed of Japanese students

But they understood the technical points well, made many questions



1<sup>st</sup> year students

Naturally, not so good as 2<sup>nd</sup> year students

# Through Courses we found that...

- Excellent  
Mathematical/Engineering knowledge/ability
- Good  
Speaking/Hearing Japanese
- Should be improved

Reading/**Writing** Technical Japanese

\* Technical books lack ruby characters ->  
some websites automatically generate them

\* keyboard(reports) / pen(exams), need two types  
of training???

From April, the 7 new third year students  
will start studying at Nagaoka

Their Japanese are at Level 2 of JEES  
Japanese Language Proficiency Test.  
(Japanese Classes work very well)

Still, problems may occur

Need Feedback to the first/latter half  
education