



viii. Nanoscience

2010 Global Summer Program Report

The University of Tokyo	
Brief description	This course provides students with an overview of the rapidly growing field of nanoscience and includes the following three modules: Biotechnology, Biomedicine & Nanobiotechnology, and Nanotechnology. Each module will provide students with an opportunity to visit active laboratories in the University of Tokyo.
Course duration:	5 – 16 July (12 days)
Tuition fees:	USD \$254 (JPY 22,200)
Accommodation:	USD \$640 (JPY55,900)
Field trip:	Exempted
Course facilitator(s):	Prof. Tatsuro IRIMURA

2. Participant and teaching staff data

	University	Number of Students	Teaching Staff
IARU Partner Universities	Australian National University	1	
	ETH Zurich	3	
	National University of Singapore	2	
	Peking University	0	
	University of California, Berkeley	1	
	University of Cambridge	2	
	University of Copenhagen	2	
	University of Oxford	2	
	The University of Tokyo	6	12
	Yale University	0	
	Total IARU partner involvement	19	
Non-IARU Partner Universities			
	TOTAL Non-IARU partner involvement		
TOTAL	19	12	

3. Successful aspects of the course

This “nano-science” course consisted of three portions, nano-biology, nano-medicine and nano-technology, which were based roughly on biology, chemistry, and physics disciplines, respectively. The backgrounds of the participating students were very heterogeneous spreading from cell biology to computer science. The students maintain such broad spectrum for the last three years. We originally thought that it was a challenge to give lectures to such a heterogeneous population of students, it turned out to work well as the outcomes reveal.

For example, a student with cell biology background from ETH Zurich states about one of nano-technology lecture that “although the lecture focused on topics I rarely study in my major cell biology, I felt that the Prof. Arakawa made an effort to break down the complexity of the addressed subjects to help non-professionals like me to follow. This gave me the opportunity to recognize the growing importance of photonics also in the field of molecular biology. I was especially impressed by the concept of quantum dots.” A student with physics major in University of Copenhagen states that “As a last comment I want to thank the IARU alliance and Prof. Miura, who was an excellent speaker, for introducing me this interesting subject of apoptosis. I will in the future follow the results of this research with excitement.” A student with genetics and development background from University of California at Berkeley states that

“I have a very strong background in the fields of biology and chemistry, but have a very limited understanding of physics and engineering. I was somewhat worried about the third part of the nanoscience course, but professor Hiramoto's introductory lecture was extremely helpful and crucial to my subsequent understanding of the lectures that followed.”

These positive comments might be resulted from our adjustments after a few years of experience. From the lecturers' side, positive comments are also given. As an example a professor in the Graduate school of Engineering reports that “Simply by answering to many questions asked by the students during the lecture, entire lecture became interactive and fun to me. I would like Japanese students, who are really passive in the class, to learn such a style by participating in this lecture series.” Positive comments are also given to the laboratory tours from the lecturers and students stating that “informative” and “enjoyable”.

All the students provide well-written essays, which were required to receive credits, which was also a good sign of the positive outcome. It appears that the load was appropriate, not too heavy and not too light.

4. Challenges and concerns for the future

From the students' side, there was no negative comment given. From the lecturers' side, many said that more Japanese students than currently in the class should participate. Another aspect is the fact that lectures given for a few weeks are not enough to provide students really good opportunity to acquire not only knowledge but also research skills. Currently, summer internship programs for graduate students are successfully run by other projects such as the Global Center of Excellence program. Because the term of this program is limited to 5 fiscal years, continuous financial support should be provided by the University or by the government.