

## 2023 Osaka University International Certificate Program Details(Continuing)

20/1/2023

Course Name	Halal Science, Technology and Innovation (HaSTI)		
Course Affiliation	Center for Global Initiatives		
Course Manager	Prof. Hasan Quamrul, Center for Global Initiatives		
Cooperative Schools	Graduate School of Science, Graduate School of Pharmaceutical Sciences, Graduate School of Engineering, Graduate School of Humanities, Osaka School of International Public Policy		
Eligibility	Graduate students of Joint Campus counterpart universities, and working people who have received at least a bachelor's degree		
Requirements for completion	6 to 8 credits	Capacity	50
Course Objective	To help the participant become broadly knowledgeable on the science and advanced technology for Halal product and service innovation in the global context, and as a result become more competent for a successful career		
Learning Goals	<ol style="list-style-type: none"> <li>1. To be able to understand the importance of science and technology in Halal products and services</li> <li>2. To be able to interact with the industry professionals in Japan and other countries for gaining further practical knowledge and experience in the field of interest</li> <li>3. To be able to make the successful utilization of the new and practical learnings by connecting with/applying in the current/new/future professional careers (though not limited to the Halal related jobs only)</li> <li>4. To be able to increase the self-confidence for competing in the job market with a higher chance of success</li> </ol>		
Components	<p>【Required Subjects】</p> <ol style="list-style-type: none"> <li>1. "Halal Science" 2. "SDGs and Asia-Pacific Region II" 3. "Advanced Technology for Halalan - Toyyiban"</li> <li>4. "Product and Service Innovation for Halalan - Toyyiban"</li> <li>5. Practical Study Abroad (PSA): "Laboratory Study I, II, III", "Field Study I, II, III", "Internship study I, II, III"</li> </ol> <p>【Elective Subjects】</p> <p>"Halal in Southeast Asia I, II, III" (in preparation), etc.</p>		
Requirements	To be able to visit a foreign country to do the PSA subjects		
Prior knowledge	None in particular, however, it is advised to make use of the knowledge acquired through this program in the future research or job.		
Special Note	All the courses in this program will be given in English.		

\*ASEAN Campus Partner Universities

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### Components

Course Numbering Code	対象	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
88B001	common	Halal Science	1			winter	15	International Exchange Subjects (GI)	
88A021/88A022	common	SDGs and Asia-Pacific Region I / II	1			spring to summer	15	International Exchange Subjects (GI)	
88A201/88A204	common	Laboratory study I		1		spring to winter	45	International Exchange Subjects (GI)	
88A202/88A205	common	Laboratory study II		1		spring to winter	45	International Exchange Subjects (GI)	
88A203/88A206	common	Laboratory study III		1		spring to winter	45	International Exchange Subjects (GI)	
88A207/88A210	common	Field study I		1		spring to winter	45	International Exchange Subjects (GI)	
88A208/88A211	common	Field study II		1		spring to winter	45	International Exchange Subjects (GI)	

88A209/88A212	common	Field study III		1		spring to winter	45	International Exchange Subjects (GI)	
88A213/88A216	common	Internship I		1		spring to winter	45	International Exchange Subjects (GI)	
88A214/88A217	common	Internship II		1		spring to winter	45	International Exchange Subjects (GI)	
88A215/88A218	common	Internship III		1		spring to winter	45	International Exchange Subjects (GI)	
88B002	common	Advanced Technology for Halalan -Toyyiban		1		spring	15	International Exchange Subjects (GI)	
88B003	common	Product and service innovation for Halalan - Toyyiban		1		spring to summer	15	International Exchange Subjects (GI)	
88B004	common	Halal in Southeast Asia I		1		spring to summer	15	International Exchange Subjects (GI)	
88B005	common	Halal in Southeast Asia II		1		spring to summer	15	International Exchange Subjects (GI)	
88B006	common	Halal in Southeast Asia III		1		spring to summer	15	International Exchange Subjects (GI)	
24S010	common	(SISC) Advanced Chemical Experiment		1		winter	15	Graduate School of Science	
88A038	common	Industry and development in the modernization of Japan: university-industry collaboration		1		winter	15	International Exchange Subjects (GI)	
88A044	common	Diversity and sustainability in food systems		1		spring to summer	15	International Exchange Subjects (GI)	
88A225/226	common	An Introduction to Qualitative Research		1		fall to winter, spring to summer	15	International Exchange Subjects (GI)	Same content offered in fall/winter and spring/summer semesters

\*Participants have to choose two or three PSA courses

## 2023 Osaka University International Certificate Program Details (Continuing)

26/3/2023

Course Name	Advanced Industrial Biotechnology		
Course Affiliation	International Center for Biotechnology		
Course Manager	Prof. Fujiyama Kazuhito, International Center for Biotechnology		
Cooperative Schools	Graduate School of Science, Graduate School of Medicine, Graduate School of Pharmaceutical Sciences, Graduate School of Engineering, Graduate School of Engineering Science, Center for Global Initiatives		
Eligibility	<ul style="list-style-type: none"> <li>• Graduate students of ASEAN Campus Partner Universities</li> <li>• Working people who have received at least a bachelor's degree from the countries where ASEAN campuses are located.</li> </ul>		
Requirements for completion	6 to 8 credits	Capacity	30
Course Objective	To gain wide fundamental knowledge about biotechnology which involves multi-disciplinary fields such as microbiology, genome engineering, biochemistry, molecular biology, cell engineering, analytical chemistry, biophysical chemistry, stem cell engineering and biochemical engineering To nurture the basic research ability for creating innovative technology to change society To become knowledgeable about intellectual properties and issues in biodiversity to benefit society To develop human resources who aim to establish the sustainable society with the ability of producing added value		
Learning Goals	To understand the relationship between manufacturing science and technology, and biotechnology To understand the importance of basic science and core technology which support biotechnology To understand the issues in exploitation of bioresources using biotechnology To understand the biotechnology and industrial technology innovation To understand the relationship between biotechnology and modern society To understand the relationship between biotechnology and SDGs		
Components	<b>【Required Subjects】</b> Common Subject (Fall, Winter Term) : "OUICP-Fundamentals of Industrial Biotechnology" Common Subject (Spring, Summer Term) : "SDGs and Asia-Pacific Region II" Practical Study Abroad (PSA) Subjects: "Laboratory Study I, II, III" <b>【Elective Subjects】</b> "OUICP-Advanced Biotechnology" Subjects offered by each graduated school are listed below.		
Requirements	To have knowledge of biochemistry at the undergraduate level. Students will be selected after screening. We welcome students who are interested in biotechnology.		
Prior knowledge	It is recommended that the students have a bachelor level of knowledge regarding biochemistry.		
Special Note	All the courses in this program will be given in English.		

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### Components

Course Numbering Code	対象	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
88B008	common	OUICP-Fundamentals of Industrial Biotechnology	1			winter	15	International Exchange Subjects (GI)	
88A021/88A022	common	SDGs and Asia-Pacific Region I / II	1			spring to summer	15	International Exchange Subjects (GI)	
88A026	common	(PSA) Laboratory study I		1*		spring to winter	45	International Exchange Subjects (GI)	
88A027	common	(PSA) Laboratory study II		1*		spring to winter	45	International Exchange Subjects (GI)	
88A028	common	(PSA) Laboratory study III		1*		spring to winter	45	International Exchange Subjects (GI)	
88B009	common	OUICP-Advanced Biotechnology			1	spring to summer	15	International Exchange Subjects (GI)	
281025	common	ESP Frontier Chemistry A			1	winter	15	Graduate School of Engineering	Only for short-term exchange students
281026	common	ESP Frontier Chemistry B			1	spring to summer	15	Graduate School of Engineering	Only for short-term exchange students
88A507	common	International Exchange Special Lecture 2(Bio-Inspired Chemical Engineering 1)			1	winter	15	International Exchange Subjects (GI)	Provided by Graduate School of Engineering Science
88A508	common	International Exchange Special Lecture 2(Bio-Inspired Chemical Engineering 2)			1	winter	15	International Exchange Subjects (GI)	Provided by Graduate School of Engineering Science
24S014	common	Current Topics I			1	fall to winter	15	Graduate School of Science	
24S082	common	Natural Product Chemistry			1	spring	15	Graduate School of Science	No classes for 2023
24S083	common	Organic Biochemistry			1	summer	15	Graduate School of Science	
24S077	common	Biomolecular Chemistry			1	winter	15	Graduate School of Science	No classes for 2023
25F004	common	Virology A			1	winter	15	Graduate School of Medicine	Only for short-term exchange students
25F005	common	Virology B			1	spring to summer	15	Graduate School of Medicine	Only for short-term exchange students

\*Participants have to choose two or three PSA courses

2023 Osaka University International Certificate Program Details (Continuing)

24/03/2023

Course Name	Nanoscience and Nanotechnology as Manufacturing Core		
Course Affiliation	R <sup>3</sup> Institute for Newly-Emerging Science Design		
Course Manager	Prof. Yasufumi FUJIWARA, Graduate School of Engineering, Director of R <sup>3</sup> Institute for Newly-Emerging Science Design,		
Cooperative Schools	Graduate Schools of Science, Pharmaceutical Sciences, Engineering and Engineering Science, Center for Global Initiatives		
Eligibility	<ul style="list-style-type: none"> <li>Graduate students of ASEAN Campus Partner Universities</li> <li>Working people who have received at least a bachelor's degree from the countries where ASEAN campuses are located.</li> </ul>		
Requirements for completion	6 to 8 credits	Capacity	inbound and outbound 15, respectively
Course Objective	To study and understand the wide range of knowledge on nanoscience and nanoengineering in various fields, such as physics, chemistry, biology, electronics, mechanics, measurement and analysis technology. To develop ability of basic research and also ability of practical application on manufacturing. As a result to foster human resources of researchers and engineers both in academia and industry having excellent ability of producing additional values by applying nanoscience and engineering.		
Learning Goals	<ol style="list-style-type: none"> <li>To understand importance of contribution to basic science and technology in nano-science &amp; engineering</li> <li>To understand role of physics, chemistry and biology in nano-science &amp; engineering</li> <li>To understand relationship between nano-science &amp; engineering and science &amp; technology for manufacturing</li> <li>To understand application of nanotechnology to electronics, mechanics and measurement &amp; analysis technology</li> <li>To understand industrial technological innovation based on nanotechnology</li> <li>To understand relationship between nanotechnology and real society</li> <li>To understand relationship between nanotechnology and SDGs</li> </ol> By understanding the above items, one can obtain ability of practical application to manufacturing core		
Components	【Required Subjects】 Common Subject : Nanoscience and Nanotechnology, SDGs and Asia-Pacific Region I Practical Study Abroad (PSA) Subjects: Laboratory Study I, Laboratory Study II Or Internship I 【Elective Subjects】 International Exchange Lectures on Nanoscience and Nanotechnology A, B and C Special Lecture on Quantum Simulation, Tutorial on Computational Nano-material Design, Industry and development in the modernization of Japan: university-industry collaboration, Laboratory Study III		
Requirements	To have knowledge of physics or chemistry at the undergraduate level. Students will be selected after screening. We welcome students who are interested in basic and applied science and engineering on the fields of nanoscience and nanoengineering.		
Prior knowledge	It is recommended that the students have a undergraduate level of knowledge regarding science and engineering in any fields.		
Special Note	All the courses in this program will be given in English.		

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Components

Course Numbering Code	対象	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
88B010	common	Nanoscience and Nanotechnology	1			winter	15	International Exchange Subjects (GI)	online course
88A021/88A022	common	SDGs and Asia-Pacific Region I/II	1			spring to summer	15	International Exchange Subjects (GI)	
88A201	common	Laboratory Study I (SS)		1		spring to summer	45	International Exchange Subjects (GI)	intensive course
88A202	common	Laboratory Study II (SS)		1		spring to summer	45	International Exchange Subjects (GI)	intensive course
88A203	inbound	Laboratory Study III (SS)		1		spring to summer	45	International Exchange Subjects (GI)	intensive course
88A213	inbound	Internship I (SS)		(1)		spring to summer	45	International Exchange Subjects (GI)	interchangeable to Laboratory Study II
88A509	common	International Exchange Special Lecture 2 (International Exchange Lecture on Nanoscience and Nanoengineering A)			1	spring	15	International Exchange Subjects (GI)	online and on-demand Provided by Graduate School of Engineering Science
88A510	common	International Exchange Special Lecture 2 (International Exchange Lecture on Nanoscience and Nanoengineering B)			1	summer	15	International Exchange Subjects (GI)	intensive course Provided by Graduate School of Engineering Science
88A511	common	International Exchange Special Lecture 2 (International Exchange Lecture on Nanoscience and Nanoengineering C)			1	summer	15	International Exchange Subjects (GI)	intensive course Provided by Graduate School of Engineering Science
281559	common	Special Lecture on Quantum Simulation I			1	spring	15	Graduate school of Engineering	online
281503	common	Tutorial on Computational Nano-material Design			1	winter	15	Graduate school of Engineering	intensive course online
88A038	common	Industry and development in the modernization of Japan University-industry collaboration			1	winter	15	International Exchange Subjects (GI)	intensive course online

\*Participants have to choose two or three PSA courses

## 2023 Osaka University International Certificate Program Details(Continuing)

08/02/2023

Course Name	Frontier Engineering Science: An Introduction through STEM-Centered Learning		
Course Affiliation	Graduate School of Engineering Science		
Course Manager	Prof. Umakoshi Hiroshi, Graduate School of Engineering Science		
Cooperative Schools	Center for Global Initiatives		
Eligibility	<ul style="list-style-type: none"> <li>• Graduate students of ASEAN Campus Partner Universities</li> </ul>		
Requirements for completion	6 to 8 credits	Capacity	7
Course Objective	<p>In order to contribute to SDGs which are the common challenges on a global scale including ASEAN countries, "STEM (Science, Technology, Engineering, Mathematics) perspectives" is essential. To acquire this perspectives, participants will realize "STEM factors" which are the basis of each theme related to SDGs through frontier researches in Engineering Science (ES) focusing on joint research.</p> <p>In addition, participants will understand "STEM", which is essential for ES human resources through close communications among laboratory staff, students and exchange students.</p>		
Learning Goals	<p>To acquire the ability to understand 1) the principle of Engineering Science, 2) the role of STEM (Science, Technology, Engineering, Mathematics) which is basic theory of Engineering Science, 3) the relationship between Engineering Science, and materials, functions and system, 4) the relationship between Engineering Science and industrial technology innovation such as extreme substances, spintronics, sunlight and future research, and 5) the relationship between Engineering Science and SDGs To gain scientific, technical and humane knowledge as an Engineering Scientist through advanced STEM practices in the fields of Materials physics, Chemistry, Chemical engineering, Frontier materials science, Nonlinear mechanics, Mechanical engineering, Bioengineering, Advanced electronics &amp; optical science, Systems science and applied informatics, Mathematical science and Mathematical science for social systems</p>		
Components	<p><b>【Required Subjects】</b> Lecture subjects for 1), 2) and 5) (2 credits)                  STEM practice subjects for 3) and 4) (Graduate School of Engineering Science) (more than two credits)  <b>【Elective Subjects】</b> Lectures for deepening 1), 2) and 3)                  Required elective subjects and elective subjects are decided baed on a consultation with a supervisor for STEM practices</p>		
Requirements	<p>To belong to a master course of a graduate school in the fields of science, technology and information or medical science, dentistry and pharmaceutical sciences                  To have interest in STEM in advanced science technology                  To be assigned to a laboratory to do STEM practices</p>		
Prior knowledge	<p>To have basic knowledge about mathematics, physics, chemistry and biology at undergraduate level which is essential for ES human resources</p>		
Special Note	<p>All the courses in this program will be given in English.</p>		

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### Components

Course Numbering Code	対象	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
290858	inbound	Engineering Science: A First Step	1			winter	15	Graduate School of Engineering Science	
88A021/88A022	inbound	SDGs in Asia Pacific Region I/II	1			spring to summer	15	International Exchange Subjects (GI)	
88A201/88A204	inbound	Laboratory study I		1		spring to winter	45	International Exchange Subjects (GI)	Course Term: Winter, Spring, Summer
88A202/88A205	inbound	Laboratory study II		1		spring to winter	45	International Exchange Subjects (GI)	Course Term: Winter, Spring, Summer
88A203/88A206	inbound	Laboratory study III		1		spring to winter	45	International Exchange Subjects (GI)	Course Term: Winter, Spring, Summer

290859	inbound	Topics in Engineering Science 1 (Mechanicals Engineering Sciece)			1	winter	15	Graduate School of Engineering Science	
290860	inbound	Topics in Engineering Science 2 (Mechanical Science and Bioengineering)			1	spring	15	Graduate School of Engineering Science	
290861	inbound	Topics in Engineering Science 3 (System Innovation)			1	spring	15	Graduate School of Engineering Science	
88A071	inbound	Introduction to Chemical Engineering Science : Basic and Bio-Inspired Approach			1	winter	15	International Exchange Subjects (G1) / Graduate School of Engineering Science	
88A507	inbound	International Exchange Special Lecture 2(Bio-Inspired Chemical Engineering 1)			1	winter	15	International Exchange Subjects (G1) / Graduate School of Engineering Science	

\*Participants have to choose two or three PSA courses

2023 Osaka University International Certificate Program Details (New/Continuing/Suspension)

24/02/2023

Course Name	Introduction to Computational Materials Design		
Course Affiliation	Graduate School of Engineering		
Course Manager	Prof. Morikawa Yoshitada, Graduate School of Engineering		
Cooperative Schools	Graduate School of Science, Graduate School of Engineering Science, R <sup>3</sup> Institute for Newly-Emerging Science Design, Center for Global Initiatives		
Eligibility	Graduate students of Joint Campus counterpart universities, and working people who have received at least a bachelor's degree are eligible		
Requirements for completion	6 to 8 credits	Capacity	15Each (Inbound / Outbound)
Course Objective	To reveal the factors which donate material properties by computer simulation based on quantum mechanics To get basic knowledge and skills about computational material design which can give a guide for designing materials with desired properties through lectures, practical trainings and laboratory works To develop human resources who are capable of utilizing quantum simulations for major issues related to the future of the human beings such as economics, energy and environmental issues		
Learning Goals	To understand the importance of computer simulation methods especially simulation methods based on quantum mechanics in material sciences To understand the utility of quantum simulation methods on designing materials To understand the utility of quantum simulation methods on SDGs To understand the collaboration of quantum simulations and demonstrations To nurture practical skills to apply quantum simulations for specific issues		
Components	<p><b>【Required Subjects】</b>                      Common Subject (Fall, Winter Term) : "OUICP-Introduction to computational materials design"                      Common Subject (Spring, Summer Term) : "SDGs and Asia-Pacific Region II"                      Practical Study Abroad (PSA) Subjects: "Laboratory Study I, II"  <b>【Elective Subjects】</b>                      "Tutorials on Computational Nano-Materials Design I", "Topics in Quantum Simulations I, II", "Solid State Physics"                      "Selected Topics in Quantum Physics of Solids", "Solid State Theory I"</p>		
Requirements	To have knowledge of Physics, Chemistry or Materials Science at the undergraduate level. Students will be selected after screening. We welcome students who are interested in understanding of Material Science by Computational Simulation at the atomic level.		
Prior knowledge	It is recommended that the students to have the level of knowledge as they have graduated from 4-year university in science and engineering field about Physics, Chemistry or Materials Science.		
Special Note	All the courses in this program will be given in English.		

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Components

Course Numbering Code	Target	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
88B007	common	OUICP-Introduction to computational materials design	1			Fall to Winter	15	International Exchange Subjects (GI)	Online Course
88A021/88A022	common	SDGs and Asia Pacific Region I/II	1			Summer	15	International Exchange Subjects (GI)	
88A201/88A204	common	Laboratory study I		1		Spring, Summer, Winter	45	International Exchange Subjects (GI)	
88A202/88A205	common	Laboratory study II		1		Spring, Summer, Winter	45	International Exchange Subjects (GI)	
281503	common	Tutorials on Computational Nano-Materials Design I			1	Winter	Lecture 13+ Practice 25	Graduate School of Engineering	Computational Material Design Workshop: Available on streaming
281559	common	Topics in Quantum Simulations I			1	Spring	15	Graduate School of Engineering	Available at ASEAN campus on streaming
281560	common	Topics in Quantum Simulations II			1	Summer	15	Graduate School of Engineering	Available at ASEAN campus on streaming
280488	common	Solid State Physics			2	Spring to Summer	30	Graduate School of Engineering	Available at ASEAN campus on streaming
280769	common	Selected Topics in Quantum Physics of Solids			2	Spring to Summer	30	Graduate School of Engineering	Available at ASEAN campus on streaming
240190	common	Solid State Theory I			2	Spring to Summer	30	Graduate School of Science	Available at ASEAN campus on streaming

\*Participants have to choose two or three PSA courses

## 2023 Osaka University International Certificate Program Details (New/Continuing/Suspension)

14th/Feb/2023

Course Name	Frontiers in Medical Physics and Medical Imaging		
Course Affiliation	Graduate School of Medicine		
Course Manager	Associate Professor, Dousatsu Sakata, Division of Health Science		
Cooperative Schools	Center for Global Initiatives		
Eligibility	<ul style="list-style-type: none"> <li>• Graduate students of ASEAN Campus Partner Universities. (Thailand, Indonesia, Vietnam, Brunei Darussalam and Malaysia)</li> <li>• Working people who have received at least a bachelor's degree from the countries where ASEAN campuses are located.</li> </ul>		
Requirements for completion	6 to 8 credits	Capacity	up to 5
Course Objective	Even in ASEAN countries, the population of elderly people is getting increased and approaching into aging society. Thus, the aim of this course is to develop humanresources who take initiative in leadership for the research/development in the medical physics and medical imaging, in order to deal with the aging society.		
Learning Goals	<p>To understand multidisciplinary basic science across physics, chemistry and biology for radiation therapy.</p> <p>To get prospectives for potential research seeds, catching knowledge that covers the current research topics.</p> <p>To get knowledge of the radiotherapy facilities for further research/development.</p>		
Components	<p><b>【Required Subjects】</b>                  Common Subject (Winter, Spring Term): "Advanced radiation treatment and nuclear medicine" and "Advanced medical imaging", Practical Study Abroad (PSA) Subjects: Select two or three courses in "Laboratory Study I, II, III"  <b>【Elective Subjects】</b>                  "Radiation physics/chemistry, and radiation detection", "Radiobiological effects and radiation treatment", and "Internship I, II, III"</p>		
Requirements	Post-graduate students in science/engineering, or medicine/life-science fields for radiation treatment. Working people in radiation treatment.		
Prior knowledge			
Special Note	All the courses in this program will be given in English. The candidates will be selected through evaluation.		

\*ASEAN Campus Partner Universities

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### Components

Course Numbering Code	対象	Course Name	Credits			Course Term	Study Hours	Course Affiliation	Notes
			Common	PSA	Elective				
255676	inbound	Advanced radiation treatment and nuclear medicine	1			winter to spring	15	Graduate school of medicine (master course)	
88A021/88A022	inbound	SDGs and Asia Pacific Region I / II	1			spring to summer	15	International Exchange Subjects (GI)	
88A201	inbound	(PSA) Laboratory study I (SS)		1*		spring to summer	45	International Exchange Subjects (GI)	
88A202	inbound	(PSA) Laboratory study II (SS)		1*		spring to summer	45	International Exchange Subjects (GI)	
88A203	inbound	(PSA) Laboratory study III (SS)		1*		spring to summer	45	International Exchange Subjects (GI)	
255677	inbound	Advanced medical imaging			1	winter to spring	15	Graduate school of medicine (master course)	
255678	inbound	Radiation physics/chemistry, and radiation detection			1	spring to summer	15	Graduate school of medicine (master course)	
255679	inbound	Radiobiological effects and radiation treatment			1	spring to summer	15	Graduate school of medicine (master course)	
255680	inbound	Internship I			0.5	spring to summer	22.5	Graduate school of medicine (master course)	On Site only
255681	inbound	Internship II			0.5	spring to summer	22.5	Graduate school of medicine (master course)	On Site only
255682	inbound	Internship III			0.5	spring to summer	22.5	Graduate school of medicine (master course)	On Site only

\*Participants have to choose two or three PSA courses