

Fukuoka Personnel Training Center for Hydrogen Energy

Fuel cells are seen as highly efficient and eco-friendly next-generation energy systems, and are being actively studied and developed for practical use around the world. However, there remain many problems in commercializing fuel cell technologies, such as the high cost of the materials, systems, system components and accessories, as well as the cost of the fuel cells themselves. Durability and reliability must also be improved. To solve these problems, the industry has an urgent need to nurture engineers who have a wide range of knowledge to promote the practical applications of hydrogen and fuel cell technologies. Responding to the demand from industries, the Fukuoka Strategy Conference for Hydrogen Energy and the International Research Center for Hydrogen Energy jointly offer courses at the Fukuoka Personnel Training Center for Hydrogen Energy throughout the year for business managers and engineers. These courses provide industrial engineers with a wide basis of education relating to hydrogen and fuel cell technologies.

Since the center opened in 2005, over 1,000 students and company employees have attended the courses to deepen their knowledge of hydrogen and fuel cells.

Fukuoka Personnel Training Center for Hydrogen Energy

○Established: October, 2005

(Principal: Dr. Hiroyuki Watanabe, Executive Advisory Engineer, Toyota Motor Corp.)

Courses offered as of fiscal (as of June, 2015)

Course type	Number of completed course	Total number of participants
Business managers' course	15	487
Business managers' fuel cell vehicle course	5	148
Engineers' course	18	275
Expert technologists' course	6	169

Comprehensive Human Resource Development Program

Human resource development programs are available to meet a variety of needs.

For businesses	Managers	<ul style="list-style-type: none"> ● Fukuoka Personnel Training Center for Hydrogen Energy Business managers' course <p>This course is intended for corporate executives who are interested in hydrogen energy. In addition to basic knowledge about the characteristics of hydrogen and fuel cells, the market trends and technologies/requirements needed for new entrants into the market are explained in a simplified manner</p>
	Managers	<ul style="list-style-type: none"> ● Fukuoka Personnel Training Center for Hydrogen Energy Business managers' fuel cell vehicle course <p>This course is intended for corporate executives who are in auto and related industries. The course provides the development trend of fuel cell cars and explanations for market forecasting after 2015</p>
	Engineers	<ul style="list-style-type: none"> ● Fukuoka Personnel Training Center for Hydrogen Energy Engineers' course <p>This course is intended for engineers at hydrogen related companies that wish to enter the market. Professors from Kyushu University and engineers from leading hydrogen - related companies deliver lectures on a broad range of issues and provide hands - on training.</p>
For students	Ph.D. Course	<ul style="list-style-type: none"> ● Doctoral course, Department of Hydrogen Energy Systems <p>An international doctoral course will be open from April 2010. Ph.D. students can perform various fuel cell and hydrogen related research using advanced research facilities. International and industrial collaborations and financial support for Ph.D. students are also important features of this course.</p>
	Master Course	<ul style="list-style-type: none"> ● Master's Course, Department of Hydrogen Energy Systems <p>A master course will also be open from April 2010. This international masters' degree course is suitable for foreign students for which many lectures are given in English. Lectures cover wide scopes of fundamentals of energy technologies, including thermodynamics, strength of materials, electrochemistry, functional materials, safety management, as well as hydrogen production, storage, and utilization technologies.</p>
For children/ members of the public		<ul style="list-style-type: none"> ● Public programs, environmental education classes, etc. <p>To raise awareness of fuel cells and energy/environmental issues, open lectures are held for the public and for local elementary/Junior high school students on the use of the hydrogen energy utilizing technology and the research facilities of Kyushu University. Assistance is provided to local municipalities when they host an environmental education class or other activities.</p>

●Curriculum of Business Managers Course for Fiscal Year 2015

Time	Lecture Title	Description	Instructor
11:00 ~ 12:00	Facility Tour	Kyushu University, Hydrogen Station, Hydrogen Society Showroom	
12:00 ~ 13:00	Lunch break		
13:00 ~ 13:10	Opening ceremony	・ Opening remarks	Fukuoka Strategy Conference for Hydrogen Energy
13:10 ~ 14:10	What's Hydrogen Energy?	・ Fundamentals Characteristics of hydrogen, technologies of Hydrogen generation, storage and transportation ・ Principles of fuel cells	Hydrogen Energy Systems Society of Japan
14:20 ~ 15:20	Market trend of hydrogen related industry	・ Introduction of market trend of hydrogen related industry	Technova Inc.
15:20 ~ 15:40	Coffee break		
15:40 ~ 16:10	Efforts towards the development of hydrogen infrastructure	・ Installation status of hydrogen station ・ Issues in hydrogen infrastructure Installation	Taiyo Nippon Sanso Corp.
16:20 ~ 16:50	Challenges in Takaishi Industry ~ Entry into the hydrogen-related industries ~	・ The chance and effort for entry of hydrogen related industries	Takaishi Industry Co.,Ltd.

●Curriculum of Business Managers(Fuel Cell Vehicle) Course for Fiscal Year 2015

Time	Lecture Title	Description	Instructor
10:00 ~ 12:00	Facility Tour Test-ride event of Fuel cell vehicle	Hydrogen Energy Test and Research Center(HyTReC)	HyTReC
12:00 ~ 13:00	Lunch break		
13:00 ~ 13:10	Opening ceremony	・ Opening remarks	Fukuoka Strategy Conference for Hydrogen Energy
13:10 ~ 14:10	Technology trend and efforts for the commercialization of fuel cell vehicle	・ Mechanism, element component and technology challenges of FCV ・ Business strategy and efforts for the creation of FCV market	TOYOTA Motor Corp.
14:20 ~ 15:20	Technology trend and efforts for spread of hydrogen-supply infrastructure	・ Type and element component of Hydrogen -supply infrastructure ・ Efforts of Relaxation of regulations and technology challenges	Iwatani Corp.
15:20 ~ 15:50	Coffee break		
15:50 ~ 16:50	Market trend of FCV & Hydrogen Station related industry	・ Introduction of market trend of FCV & Hydrogen Station related industry	Technova Inc.

●Curriculum of Engineers Course for Fiscal Year 2015

1 st Day	Lecture Title	Description	Instructor
13:00 ~ 13:10	Opening ceremony	・ Opening remarks	Fukuoka Strategy Conference for Hydrogen Energy
13:10 ~ 14:10	Challenges and efforts to hydrogen society	・ National policies and regulations review of hydrogen energy ・ Efforts of NEDO towards hydrogen society	New Energy and Industrial Technology Development Organization
14:20 ~ 15:50	Forefront of Hydrogen and Fuel Cell Research	・ Components of fuel cell system ・ Principles of fuel cell	Professor Kazunari SASAKI (Kyushu University)
16:00 ~ 17:00	Technology trend and efforts for the commercialization of fuel cell vehicle	・ Mechanism, element component and technology challenges of FCV ・ Business strategy and efforts for the creation of FCV market	TOYOTA Motor Corp.
17:30 ~ 19:00	Participant information exchange	・ Networking opportunities	Fukuoka Strategy Conference for Hydrogen Energy

2 nd day	Lecture Title	Description	Instructor
10:00 ~ 10:45	Facility Tour	Kyushu University, Hydrogen Station, Hydrogen Society Showroom	
11:00 ~ 12:00	Fuel cell performance evaluation method	・ The theory of fuel cell performance evaluation ・ Evaluation method and applications.	Professor Kohei ITO (Kyushu University)
12:00 ~ 13:00	Lunch break		
13:00 ~ 14:00	Technical trend of Hydrogen production	・ Type of Hydrogen production technology and principles ・ Development status and technical issues of hydrogen production technology	Professor Hiroshige MATSUMOTO (Kyushu University)
14:10 ~ 15:10	Technology trend of stationary fuel cell system for industrial use	・ Mechanism and components of stationary fuel cell system for industrial use ・ Technical issues and future developments	Mitsubishi Hitachi Power Systems LTD.
15:20 ~ 16:20	Hydrogen influence on the strength of the metal materials	・ Hydrogen influence on the destruction properties of the metal materials(fatigue and brittle fracture)	Professor Masanobu KUBOTA (Kyushu University)
16:30 ~ 17:30	Polymer materials for High-pressure hydrogen equipment	・ Overview of polymer materials for the high-pressure hydrogen Equipment ・ Technical challenging and current trend	Professor Shin Nishimura (Kyushu University)

3 rd day	Lecture Title	Description	Instructor
10:30 ~ 12:00	Facility Tour Test-ride event of Fuel cell vehicle	Hydrogen Energy Test and Research Center (HyTReC)	HyTReC
12:00 ~ 13:00	Lunch break		
13:00 ~ 14:00	Technological trend and future development of hydrogen station	・ Types and components of hydrogen supply infrastructure (Facility Equipment and Materials) ・ Technological factors expected to reduce costs	JX Nippon Oil & Energy corporation
14:10 ~ 15:10	Technological trend and future development of High-Pressure hydrogen gas tank	・ Type and component of High-Pressure hydrogen gas tank (Type I ~IV) ・ Technological factors expected to reduce costs	Japan Petroleum Energy Center
15:20 ~ 16:20	Technologies of large-scale hydrogen -energy storage and transportation	・ Development of large-scale hydrogen storage and transportation technology by organic hydride method ・ Technological factors expected to reduce costs	Chiyoda corporation
16:30 ~ 17:30	Current situation and future development of stationary fuel cell system	・ Mechanism and components of stationary fuel cell system for household use ・ Technical issues and future developments	Aisin Seiki Co.Ltd.

4 th day	Lecture Title	Description	Instructor
9:30 ~ 16:50 (Lunch Break: 12:40 ~ 13:40)	[Practical training : 3hr] (1) Practice of hydrogen utilization mechanical system	<Metal materials strength> ・ Fracture toughness test ・ SEM observation of fracture surface	Asso. Professor Shigeru HAMADA (Kyushu University)
		<Tribological properties> ・ Friction wear test in hydrogen atmosphere ・ Laser microscopy observation of testing sample	Professor Yoshinori SAWAE (Kyushu University)
	[Practical training : 3hr] (2) Fuel cell assembly and measurement (PEFC : SOFC)	<PEFC> ・ Fuel cell assembly ・ Measurement and Analysis of current-voltage properties of PEFC	Asst.Professor Hironori NAKAJIMA (Kyushu University)
		<SOFC> ・ Measurement and Analysis of current-voltage properties of SOFC	Asso.Professor Yusuke SHIRATORI (Kyushu University)



Lecture



Hands-on training



Facility tour