COMPUTER

1. PURPOSE OF THE COURSE
Refer to each sub-course.

2. TRAINING PROGRAM
(1)General Orientation and Japanese Language Program
The General Orientation and Japanese Program are organized at the Osaka International Centre (OSIC) of JICA prior to the technical training, to assist participants in understanding Japan and adjusting themselves to life in Japan, and thus to facilitate effective training.

(2)Technical Training
Refer to each sub-course. (Total: seven sub-courses)

3. NUMBER OF PARTICIPANTS TO BE ENROLLED
Minimum: 7 persons (one for each sub-course) / Maximum 10 persons (If each sub-course is filled, some sub-courses may accept second candidates. See each sub-course for details.)
Candidate should be qualified.

4. TRAINING DURATION
From March 7, 2010 to November 18, 2010
(1)Briefing
March 8, 2010
(2) General Orientation
From March 10, 2010 to March 12, 2010
(2)Japanese Language Program
From March 15, 2010 to April 30, 2010
(3)Technical Training
From May 6, 2010 to November 18, 2010

5. TRAINING INSTITUTION
(1)General Orientation / Japanese Language Program
Osaka International Centre (OSIC), JICA
25-1, Nishi-Toyokawa-cho, Ibaraki-shi, Osaka, 567-0058, Japan
Tel: +81(*)-72(**)-641-6900 Fax: +81(*)-72(**)-641-6910
URL: http://www.jica.go.jp/worldmap/english.html#osaka

(2)Technical Training
Hokuriku Branch Office, JICA
Rifare Bldg (Office Tower) 4F, 1-5-2, Honmachi, Kanazawa-shi, Ishikawa-ken, 920-0853, Japan
Tel: +81(*)-76(**)-233-5931 Fax: +81(*)-76(**)-233-5959

Kanazawa Institute of Technology
7-1, Ohgigaoka, Nonoichi-machi, Ishikawa-gun, Ishikawa-ken, 921-8501, Japan
Tel: +81(*)-76(**)-248-1100
URL: http://www.kanazawa-it.ac.jp/ekit/

(*) country code of Japan (**) area code

6. CONDITIONS OF APPLICATION
(1)Applicants should have graduate degree in a certain scientific or engineering educational course of a university or an institute of technology, showing the certified list of subject items with the marks obtained in

each subject.

(2)Applicants should have an adequate ability in English conversation to be able to perform satisfactorily in the course. (TOEFL score: more than 490)

(3)Applicants should be good in health, both physically and mentally, to undergo the training; pregnancy is regarded as a disqualifying condition for participation in the training.

(4)Applicants should not be presently serving in the military.

7. APPLICANTS MUST SUBMIT ANNEX WITH THE APPLICATION DOCUMENTS

(1)Applicants should submit the certified list of subject items with the marks obtained in each subject issued by a university or an institute of technology.

(2)Applicants should decide their order of preference $1^{st} \sim 7^{th}$ from the following seven sub-courses. Once an applicant decides, he/she should write the order of preference in Annex sheet. This will be used only as a reference for the screening committee.

Note: Applicants should be capable enough to pursue any of the sub-courses in order for the training institute to have a wider range of decision on screening. This is why any lack of preferences may result in an unsatisfactory application.

(3)Applicants are required to answer the questions on Annex sheet.

Sub-course Title: Distributed Software Integration and Applications for Internet

(The number of acceptable participant：1)

Purpose of the Course:

The participants is expected to have experiences on client server type Internet system integration and programming for concurrency and distributed objects or Web servers.

For example, the participant will have an experience of designing a (prototyped) Web system, installing open source software (though not precluding reasonable commercial software), and programming to implement the system.

Course Description:

Designing a prototyped system:

Example projects are: Scheduling management; Photo album; Scholarship application; Customer support; Hospital reservation; Questionnaire survey (J2EE); JICA trainee administration systems; Muti-agent application; Portable Music Kiosk (using Python/TurboGears); Web application (using Ruby on Rails 2.0);

Integrating open software (suggested)

(1) Linux/Ubuntu server, learn emacs etc.
(2) Web server e.g., Apache, Tomcat (Java), WEBrick or Mongrel (Rails), CherryPy (Python)
(3) Database, e.g., MySQL, PostGreSQL
(4) Language processors, e.g. Java, PHP, Python, Ruby,etc.
(5) IDE tool: Eclipse (optional)

Programming and debugging

Traditional and today's industrial frameworks are:

(1) MVC programming using Java Servlets, JDBC, and JSP; otherwise,
(2) MVC programming using J2EE frameworks (such as JBoss, Structs, Hybernate, etc.),

Our recent interests are:

(3) Rapid agile programming using *Light-weight Languages (LL)*, such as *PHP, Perl, Python, Ruby* etc, and their frameworks (*Ruby on Rails, Django, TurboGears for Python*)

Optionally, following tools and methods are suggested

(4) TDD (Test Driven Design and unit test), version control (e.g., SVN, Git)
(5) Testing by Selenium IDE, firebug, our lab originated debugger Dionea (see, sourceforge.net),
(6) Other methodologies, if proposed, are left for discussions.

Evaluations

The final report should be specified from the following viewpoints:

(1) Intended purpose and achieved result (usage)
(2) Achievement level
(3) Project productivity
(4) Other feedbacks

Hardware and software environment:

(1) A desktop computer of exclusive use for development
(2) A laptop computer of exclusive use for development
(3) Other desktop/laptops are available for debugging
(4) Basically free software is recommended,
(5) Multimedia tools on Windows (2000/XP) to be purchased, if needed.

Sub-course Title: Java Applications on the Internet

(The number of acceptable participant：Maximun2, if all six sub-courses are filled.)

Purpose of the Course:

The participants are expected to know fundamental technologies necessary for constructing the internet Web system and how to create applications (e.g. Geographical Information System (GIS) on Internet) which extensively use the technologies.

Course Description:

The participants learn technologies of Internet system including following concepts.
(1)WWW, HTML, XML, Ajax
(2)JAVA, JavaBeans, JSP
(3)Database
(4)GIS on Internet (e.g. Practical application of Google maps by the cellular phone with the functionality of GPS)
(5)Application programming on Internet

Hardware and Software Environment:

(1)Workstations: alpha machine, Linux server
(2)Personal computers: Windows XP, 2000 and Linux
(3)Computer software
- Apache, Tomcat and Ajax
- Java, C/C++,
- Database (Oracle , MySQL)
- GIS system
- Photoshop, Illustrator

Sub-course Title: Embedded Computer Systems Design

(The number of acceptable participant：1)

Technology field: Computer science and engineering

Purpose of the Course:

The participants are expected to learn design methodologies for embedded computer systems including processor and interface modules to be implemented into FPGAs (field programmable gate arrays) by using a graphical design tool called Visual Elite.

Course Description:

Suggested projects include the following steps:

(1) Basic training:

- Design of functional circuit module by using logic-gate symbols, truth tables, state-transition charts, and flow charts.
- Implementation of the functional circuit modules into FPGAs.
- Assembler-level programming using an original 16-bit processor module and its emulator system.

(2) Development of advanced processor modules providing some accelerator circuits such as decimal adder, forting-point adder, and/or parallel pipeline sorting unit, including designs for processor architecture and instruction set.

(3)Development of practical embedded computer systems using the advanced processor modules described above usable for such as robot controlling, computer network switching, or special purpose accelerating general computer systems.

Hardware Environment:

Windows-XP workstations

Software tools:

Visual Elite and related tools (graphical logic systems design tools by English).

Required knowledge:

Basic theory for gate-level logic circuit designs.

Basic software programming for describing flow charts.

Sub-course Title: Multimedia Technology for the Internet

(The number of acceptable participant：Maximun2, if all six sub-courses are filled.)

Purpose of the Course:

Multimedia means the computer technology which deals with various information including texts, (movie) pictures and sounds together with the media which store or communicate these data. This technology is very important for the Internet, especially Web site construction to make the Web pages attractive. The aim of this course is to learn first the basics of multimedia technology and then construct some web application including various multimedia data which is useful for some purpose. Though the theme of the application is free, inclusion of some educative meaning is expected.

Course Description:

Possible programs for this course may be as follows, though it will be changed according to the background and purpose of the student:

(1) Basics of Multimedia Technology
Meaning of multimedia, Audio Technology, Video Technology

(2) Data Storage and PC interfaces
Various Storage Media and Drives,
IDE(ATAPI), SCSI, USB, IEEE1394

(3) PC Architecture for multimedia applications
Study of the multimedia functions of MS Windows (multimedia device type, media control interface, capturing audio data, capturing video data etc.)

(4) Authoring Technique
Authoring tools, Screen and Objects, Events and Actions, Script Programming

(5) Project to develop a multimedia application
Project design, Collecting multimedia data, Programming and Assembling

(6) Optional Program (XML technique for Internet and Database)
XML document, DTD, Data Binding, Document Object Model (DOM),
XSLT, SAX

Sub-Course Title: Visualization Techniques in Computer Graphics

(The number of acceptable participant：1)

Technology Field: Computer Graphics, Geographic Information System, Remote Sensing, and Web programming.

Capacity: 1, (Max. 2)

Purpose of the course:

The objective of the training course is to provide the latest available computer techniques for visualizing our natural and man-made environments. The techniques for building 3D graphics contents in the internet site are learned by this project study. Some examples are as follows:

- Application of geo-visualization techniques for presenting and exploring structures and processes from geospatial data;
- real-time visualization techniques, including modeling of Cars, human bodies, trees in 3D city, texturing for rendering such models;

Course Description:

(1)Learn Basics

- Remote sensing and Geographic Information System (GIS)
- OpenGL or Mesa 3D programming
-Knowledge of GeoElement Library in Visual Studio C++

(2)Independent Study under a specific research project theme:

Some suggested themes:

-Development of an application program for modeling and rendering of 3D city, using GeoElement Library.

-Development of visualizing 3D Earth environment, based on the remote sensing data and GIS.

-Building 3D graphics scenes and animations using Maya 8.0 or 3Ds Max.

-Making of 3D Graphics animation movies using Maya 8.0. or 3Ds Max.

-Development of navigation system using GPS and GIS data.

-Development of internet DB system for GIS and remote sensing images, using apache, PHP (or JSP), and MySQL.

-Analizing the remotely sensed satellite image data.

Additional theme may be possible, depending on the needs and skills of the student through discussions.

(3) Hardware and Software environments

OS: AIX, Solaris, Linux, Windows XP, OSX

Softwares: Maya 8.0, Maya 8.5, 3Ds Max 7.0 for 3D graphics,
IDL 6.3 and Matlab for visualization,
GeoElement for 3D graphics Library for Visual Studio 2005,
Authoring tools: Adobe Premiere Pro, After Effects, Audition,Photoshop, Illustrator,
Open source: Fedora Core, Apache, PHP, Grass for GIS, MySQL for Remote Sensing image DB
Exclusive use of a desktop computer for the project study

Sub-course Title: Dynamic Contents Management System for the Web Database Application

(The number of acceptable participant：Maximun2, if all six sub-courses are filled.)

Purpose of the Course:

The purpose of this course is two-fold: (i) to understand the mechanism of the Dynamic Contents Management System (henceforth, DCMS), making use of databases such as XMLDB and RDB as well as the server-side scripts as php, python, JSP and such, (ii) to develop such a system based on promising information design theories, instructional design theories, and e-learning theories according to one content area of your interest.

Prerequisite:

The participants are expected to know network, various types of databases, the development as well as the management of the Web database applications using server-side programming as well as the client-side programming. The concepts such as ADO, ODBC, OLEDB and JDBC are important in this course.

It would be a great advantage if the participants are familiar with some instructional design theories and inferential statistics to evaluate the developed system in terms of learning effectiveness.

Further, in order to implement the visualization and interactivity in such a DCMS, some prior skills to manipulate such multimedia contents as interactive computer graphics animation, streamed videos, graphics/animation tools such as FLASH, Director, MAYA, 3DS Max or QED would provide the participants with a great start.

Course Description:

The course includes the following aspects:
(1)Understanding and developing the concept of learning objects as well as the Content Management System
(2)Understanding and developing how to implement interactivity and multimedia in CMS.
(3)Understanding some promising instructional design theories
(4)Understanding the basics of how the network/Internet works
(5)Understanding and developing how to make use of databases in CMS
(6)Understanding the server-side (Web database application) as well as the client-side programming

Note: Based on prior knowledge level of the participants, the items above will be rearranged or reorganized to maximize the learning effect.

Research Environment:

Hardware: MacBook Pro, Personal Computer (Intel Dual/Quad Core), Web Video Camera

Software: MSDN, Adobe (Creative Suite, Flex Builder), CG (Maya, 3DS MAX), QED, Matlab/Simulink, etc

Sub-Course Title: Computer Oriented Intelligent Robot Control

(The number of acceptable participant：1)

Purpose of the Course:

The participant is expected to have fundamental technologies about the Internet and programming skill. In this course, the participant design basic and implement the software technology about intelligent robot.

(1) Reactive behavior

The robot understands the event of the real world, and it acts.

Keyword: Reflexive behavior, fixed behavior pattern, rhythmic motion generation

(2) Deliberative behavior

The robot accomplishes a series of act comparing the map of the environment and existing state of things.

Keyword: Self localization, Navigation, Path planning, Map generation

(3) Adaptive behavior

The robot improves the behavior of the self through the experience.

Keyword: Motor learning, supervised learning, Reinforce learning, unsupervised learning

(4) Cooperative behavior

Group behavior that action of two or more robots achieves a value that is higher than action of individual in constant evaluation axis.

Keyword: Cooperative by observation, Behavior prediction, Cooperative transportation

(5) Mutual understanding

The robot understands person's behavior and the intention and feelings.

Keyword: action understanding, imitation, body image, object recognition, natural language understanding, emotional interaction

Hardware and software environment

Hardware: Personal Computer (Intel Dual/Quad Core), Robot (Robovie R2), High Vision Camera Unit, Mote sensor, Wireless Location sensor (Ekahau)

Computer Software: Microsoft (Developer Network Academic Alliance, Office Enterprise), Adobe (Creative Suite, Flex Builder), CG (Maya Unlimited, 3D Studio MAX), SPSS (Base, Categories, Conjoint, Tables, DataVal, Amos, Clementine), Matlab/Simulink, etc

ANNEX

Japan –Mexico Exchange Program 2010

Full Name	
Where to contact	Tel. Fax. Email.
TOEFL Score	

Please refer to the course information and write your order of first to sixth preference below.

Sub-course title	Your order
Distributed Software Integration and Applications for Internet	
Java Applications on the Internet	
Embedded Computer Systems Design	
Multimedia Technology for the Internet	
Visualization Techniques in Computer Graphics	
Dynamic Contents Management System for Web Database Application	
Computer Oriented Intelligent Robot Control	

Describe the subject of your interest and explain what kind of skill you want to acquire through this course.
Write your work experience
To participate in this course, □ I quit my job □ I keep my position at work □ Others ( )
Explain how you would like to use your training experience on your return.
Introduce yourself

You must attach the certified list of subject items with the marks obtained in each subject issued by the university or institute of technology that you graduated from. And please check the documents with the below check list before submitting the documents.

Check List

- □ Application form: Did you fill the all blank? Were there no doubts on your remarks in the document?
- □ Annex: Did you fill out the all blank?
- □ Attachment: Did you attached your certfied list of suject items?

Caution: If there is any mistaken in the documents, the applicant will not be accepted in this course.