Developing World-Class Human Resources in Information Security

As information technology has become increasingly vital to our society and economy, information security-related incidents and damage have continued to rise. Unfortunately, there is a significant shortage of information security experts in all sectors, including companies and government organizations, and especially in Japan. There is an urgent need to train competent leaders, so Carnegie Mellon CyLab Japan has created a Master of Science in Information Technology - Information Security (MSIT-IS) program in order to meet the need for such experts.

Obtain Broad Knowledge and Skills through a Practical Curriculum

The MSIT-IS prepares students to become leaders in the ever-changing field of information security. By blending education from the fields of information technology, business management and policy, students can acquire the knowledge and skills required to become researchers, teachers, or information security professionals at the rank of Chief Information Security Officer (CISO) at companies or government organizations. The curriculum provides background, insights, and general and technical coverage of key elements of information security, while equipping students with the analytical methods and management practices needed to succeed as managers and technologists in the growing and rapidly changing field of information security.

What makes CyLab Japan’s curriculum so unique is its hands-on training approach to real problems. For example, students are given the opportunity to analyze the vulnerability of a system or a network that is actually being used at a company. They are then asked to provide suggestions on how to improve the situation or act as a CISO who is facing serious problems and has to make responsible decisions. As such, the curriculum of the MSIT-IS provides students with a core set of information security knowledge and skills required in today’s business world.

※CISO ･･･ Chief Information Security Officer

Chief Officer responsible for information security at a company. CISOs implement security measures against personal data leakage or system invasion by hackers.
A Curriculum That Fits Today's Needs

Experience the Cutting Edge of Information Security in Japan

Information security is one of the fastest changing areas in the field of IT, with daily fluctuations in technology and business. CyLab Japan provides interactive courses on the practical aspects of information security, which are taught remotely from the U.S. campus of Carnegie Mellon University using the latest in distance-education technology.

Curriculum Detail*

Core Courses (7 courses)
- Fundamentals of Telecommunication Networks
- Introduction to Information Security
- Security Architecture & Analysis
- Information Security Risk Analysis
- Information Security Risk Policy and Management
- Statistics for IT Managers
- Decision Making under Uncertainty

Electives (4-6 courses)
- Applied Information Assurance
- Security in Networked Systems
- Telecommunications Management
- Economic Analysis
- Applied Cryptography
- Secure Software Engineering
- Database Management

Project Examples (topic-based research)
- Security of Information Appliances
- Secure Ad-hoc Network
- Automatic Reverse Engineering
- Techniques against Information Leakage in P2P Network
- Economical Analysis in Information Security
- Network Design based on Economical Rationality

Remote-teaching conducted in Japan by Dr. Richard Nolan, a researcher at CMU CERT/CC, to students at both Carnegie Mellon Pittsburgh and CyLab Japan.

*2006 Curriculum (reference)

Academic Degree
Master of Science in Information Technology - Information Security

Period
16 months (4 months x 4 semesters)

Total program credits
144 credits
- Core courses: 6 courses 60 credits
- Electives: 4-6 courses 48 credits
- Master's Project: 36 credits
**Producing Adaptable and Capable Security Professionals**

- **An Educational Environment that Creates Professionals**
  
  Some courses in the MSIT-IS program are taught remotely from Carnegie Mellon’s main campus via distance learning technologies, while the rest are taught on-site in Kobe by CyLab Japan faculty. There are also local co-instructors and teaching assistants who support the students at CyLab Japan. Although classes are conducted in English, CyLab Japan’s bilingual faculty and assistant instructors ensure that international students learn more quickly than they might at the University’s main campus in the U.S.
  
  *Most of the courses are discussion-format, and students are required to do reading assignments which may consist of several book chapters and/or technical papers. Students’ performance is evaluated by written summaries of the readings and their active participation during lectures. With this course format, students acquire a solid background in information security, establish a world-class network of contacts, and improve their English language skills.*

- **Learning from Experts**

  ![Teacher: Nicolas Christin, Ph.D.](image)

  Computer networks, including network economics and network security

  **Q1. What are the aims of CyLab Japan?**

  A1. The economic and societal need for information security has dramatically increased over the past twenty years, creating a high demand for security professionals. The main goal of the Master’s in Information Technology - Information Security (MSIT-IS) at CyLab Japan is to answer this demand, by training tomorrow’s leaders in information security.

  **Q2. What do CyLab Japan students do after graduation?**

  A2. As recipients of a degree from Carnegie Mellon University, and coming from an international program, MSIT-IS graduates have a large range of options available to them, at the local, national or international levels. A majority of graduates return to industry, where they are immediately ready to assume technical management roles (e.g., information security officers). Others elect to join security consulting positions. Finally, some of our past graduates with an interest in research have also been successful in joining top Ph.D. programs. Thus far, our students have had a 100% placement rate after graduation.

  **Q3. What competitive advantages do CyLab Japan graduates have?**

  A3. Designing secure systems or policies requires to simultaneously consider managerial and technical perspectives, and to know how to adapt to evolving threats. Further, in the networked society of the 21st century, security professionals must understand global aspects. By blending Japanese and Western cultures, and by combining a strong technical curriculum with management science, the MSIT-IS at Carnegie Mellon CyLab Japan offers an opportunity unique in the world, to train experts ready to address modern security challenges. Through the MSIT-IS curriculum, students gain the perspective necessary to become world-class security experts, while simultaneously acquiring the ability to speak a common language both with technologists on the one hand, and with company executives on the other hand.
Choose a learning style to fit your own lifestyle

Opportunity to acquire world-class knowledge

CyLab Japan provides students with an opportunity to acquire world-class knowledge in 3 ways: study at Carnegie Mellon, take courses at Carnegie Mellon while enrolled at another university, or participate in seminars after work.

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<tr>
<th>Carnegie Mellon University Master’s Program</th>
<th>$17,280/semester (2007)</th>
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<tbody>
<tr>
<td>MSIT-IS degree can be obtainable in 16 months</td>
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<tr>
<th>Non-Degree Students</th>
<th>$5,266/subject/12 credits (2006)</th>
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<tr>
<td>Can receive 12 credits after satisfactorily completing each course. An official transcript from Carnegie Mellon is issued.</td>
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<tr>
<th>Auditing Students</th>
<th>$5,266/subject/12 credits (2006)</th>
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<tr>
<td>Equivalent of 12 credits can be received after satisfactorily completing each course, but no official transcript from Carnegie Mellon is issued.</td>
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*In addition to tuition fee, registration and text book fees are also required.

Aiming to become a Security Professional

CyLab Japan 2006 Student
Mr. Ash Bashir (24)

Q1. What is your background?
A1. I was born in Kashmir and moved to England with my parents when I was two years old. I’ve lived in England most of my life. I went to the University of London for my undergraduate studies and then came to Japan on the JET Program to teach English at a High School in Hyogo.

Q2. Why did you choose CyLab Japan?
A2. I knew I wanted to enter the field of Information Security, and after completing my time teaching English I had decided to go back to university. CyLab Japan was the perfect place for me; I could continue living in Japan and gain a Masters degree from a world renowned institute.

Q3. What have you leaned during the Masters program?
A3. Before starting the program I had naturally expected to develop my understanding of Information Security. During the program not only have I gained a deep understanding of the technical and managerial aspects of effective Information Security, but I have developed my critical thinking ability.

Q4. What will you do after graduation?
A4. Currently I’m considering working as an Information Security Consultant either in Japan, England or the United States. The Masters program has opened so many doors for me and I’m sure I have a challenging and positive future ahead.
Carnegie Mellon - On the Cutting Edge of Information Security

- American Master’s Degree is obtainable in Kobe
In the fall semester of 2005, in collaboration with Hyogo Institute of Information Education Foundation, the Information Networking Institute (INI) of Carnegie Mellon began offering the Master of Science in Information Technology - Information Security Track (MSIT-IS) at Carnegie Mellon CyLab Japan. The MSIT-IS degree prepares students to become leaders in information security by blending education from information security technology, business management, and policy. While living in Japan, students are able to join a top-level university that has world-class research activities. CyLab Japan aims to become a center of research & development, as well as a center of human resource development in information security in the Asian region.

Research Organization in Information Security
As one of the world’s premier institutions for computer science research and education, Carnegie Mellon has a top ranking in the U.S. ranking of graduate schools in Computer Science and Information and Technology Management (source: “America’s Best Graduate Schools 2006”). As research in information security cannot be restricted into a single field, Carnegie Mellon launched the CyLab project in 2003 under the direct control of the University President, Jared Cohn, to realize the great need for interdisciplinary research.

Strong Support for Students

- Support

  - Language
As all lectures are conducted in English, CyLab Japan provides students with an English Help Desk (EHD) and a support system which enables them to attend free English lessons at famous English schools. A service that will edit and correct students’ project reports and theses is also available at no charge.

  - Scholarships
CyLab Japan offers an interest-free student loan covering the entire cost of tuition, along with a special tuition waiver scheme (amounting to half the loan) for those who are able to obtain their degree during the prescribed period of time. This offer, however, is only available for a limited period.

A full scholarship Grant for exceptionally talented Asian students is also available.

- Daily Life
We help students from overseas get settled in Kobe by helping them find housing. The Hyogo Institute of Information Education Foundation may also act as their guarantor when signing housing contracts.

- Employment
We offer personal guidance to those students seeking employment. Carnegie Mellon University’s job database is used for job inquiries outside Japan (especially in the U.S.).
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