Embedded System Education in the e-Living and SoC Era

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https://qube. slrc.kyushu-u.ac.jp/
The e-living Society

Our Life, Property and Privacy heavily depend on IT.
Education for

• Users of Systems and Devices including SoCs
  – Citizen should understand Mechanisms and Principle of Systems.
  – Different from PC usage

• Engineers who design Systems, Devices and SoCs
  – Technology is changing very quickly.

• Students who will be Engineers of Future Systems, Devices and SoCs
  – The next generation engineers should have skills on HW and SW design, and insights for future world.
  – Requirement for Project Leaders
Needs for User Education

Values and Credit on a Chip

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E-Money
$500

Personal Information

$200

Signature

$30/Chip

Credit Cards

QUBE
Q-shu University hardware/software Borderless system design Education program
Education for Engineers

• QUBE
  - (Kyushu(Q-shu) University hardware/software Borderless system design Education program)

• Education Program for
  - SoC Engineers
    - System Designers
    - Hardware (Logic) Engineers
    - Embedded Software Engineers
  - Engineers in industry

• Catch up the progress of technology
  - HW, SW and co-design
  - Project Base Learning Course (8 days)
  - 2 days Lectures by Top Professors (27 courses)

• Details are presented in WESE by Dr. Hisazumi.
New Education Program for Codesign

**Q-shu University hardware/software Borderless system design Education program (QUBE)**

- **Purpose**: Educate highly qualified and skilled system LSI design engineers for VLSI design, embedded software design and HW/SW co-design
- **Period**: 2005.7 ~ 2010.3
- **Goal**: Totally 360 engineers

**System LSI Research Center**
Graduate School of Information Science and Electrical Engineering
Kyushu University

- **Advanced level**
  - Experienced Super Engineers
  - About 10 years' job experience
- **Master level**
  - About 3 years' job experience
- **Graduate level**
  - New Employee, graduate student
- **Introduction level**
  - University student

**Offer Educational Know-how**
**Backup by the Staff**

- Cooperated Lecture: Real Embedded Software Development Engineering
- Fukuoka Innovative CLUSTER
- Design Method and Education Division System LSI Research Center
- 21st Century Center of Excellence Program

**Shift Upper-level Lectures**

**Application/Practice Courses**
- Basic Courses

**College of System LSI, FUKUOKA**
Education for Students

- **Leading IT Specialist Education Program**
  - Program of Ministry of Education, Culture, Sports, Science and Technology
  - Pressure from Federation of Economic Organization
  - 6 out of 26 proposal are accepted (2006-2009)

- **Education for Top Software Engineers**
  - Embedded Software
  - Enterprise System
  - Security (next year)

- **Request of Project Leaders**
  - Leaders for project with 200-3,000 engineers
  - SoC, embedded software, networks
  - Experiences of Project Management
Education for Graduate Course

Kyushu University Advanced ICT Architect Course

Technology and Theory

Software, Hardware and Network Technology
- Embedded Systems
- Enterprise Systems

Projects

- System Development Project
- Problem Solving Project
- Advanced Real Project

Internship In Industry 1-3 months

Project Base Learning

Philosophy and Social Sci.
- History of IT
- Relation of IT and Social Systems

Human Skills
- Leadership for Project Management
- Communication Skill
Conclusion

- Users of Systems and Devices including SoCs
  - Education in elementary and junior-high schools
  - Education for citizen
  - Easily understandable system

- Engineers who design Systems, Devices and SoCs
  - Refresh education of engineers
  - Engineers understanding both HW and SW
  - Project Management, Intellectual Properties and Codesign
  - QUBE

- Students who will be engineers of Systems, Devices and SoCs
  - Education of Project Leaders
  - Technology, Philosophy and Human Skill
  - Advanced ICT Architect Course