

## EM601h Dependable Computing by Prof. Takashi Nanya

### Personal Information:



Prof. Takashi Nanya is a person having a wide experience of working in Research Laboratories, serving as a faculty, and also advisor to the industry.

He is the mentor for CSE and ECE disciplines under Indo-Japan collaboration. He is helping IITDM Jabalpur since its inception in curriculum development, arranging lectures by Japanese professors, fruitful visits of IITDM faculty to Japan, and also students' internships. He has been a key person for successful internships of IITDMJ students in Canon.

Prof. Takashi Nanya received the B.E. and M.E. degrees in Mathematical Engineering and Information Physics from the University of Tokyo, Japan, in 1969 and 1971, respectively, and his Ph.D. degree in Electrical Engineering from the Tokyo Institute of Technology, Japan in 1978.

After working for **Central Research Laboratories** for around 10 years, he joined the **Tokyo Institute of Technology**. In 1996, he joined the **University of Tokyo**. From 2001 to 2004, he was the director of the **Research Center for Advanced Science and Technology (RCAST)**, and a councilor of the University of Tokyo. In 2010, he left the University of Tokyo and joined **Canon Inc.**, Japan as a full-time advisor in research and development. He is also a member of the **Science Council of Japan**. Currently, he is Professor Emeritus of both the **University of Tokyo** and the **Tokyo Institute of Technology**.

He is a Fellow of the **IEEE** and **IEICE**. In past years, he served as the Chair of **IEEE-CS Technical Committee** on Dependable Computing and Fault Tolerance, and the Chair of the **Steering Committee of International Conference on Dependable Networks and Systems (DSN)**. He also served as a Vice-chair of the **IFIP WG 10.4 "Dependable Computing and Fault Tolerance"**. He served as the General Chair of **ASYNC**, **PRDC**, **DSN** and **ISAS**, and as the **Programme Committee** Chair of **FTCS** and **ASP-DAC**. He served as an Associate Editor of **IEEE Transactions** on Computers and a Guest Editor of **IEE Proceedings** on Computer and Digital Techniques.

### Course Information:

Prof. Takashi Nanya is offering the course on "Dependable Computing" since 2010. He would be offering this course for the seventh time during February 8-12, 2016.

We are living in information society which is dealing with various risk factors including ambiguous responsibility, service diversity, uncertain human behaviour, data explosion, system complexity, system aging, VLSI miniaturization etc. As engineers, we are supposed to make computer systems and networks more dependable. These systems are expected to deliver services that can justifiably be trusted. Therefore, it is important to understand dependability and identify the limits and challenges for design and development of dependable systems.

Course contents include the following topics:

1. Introduction of Dependable Computing;
2. Error Detection (Fault detection is only possible through detecting errors caused by the fault): Error models, Evaluation Metrics, Redundancy techniques, and Error-detecting Codes;
3. Recovery: Hardware Fault Tolerance, Reliability issues;
4. Issues in Distributed Systems: Clock Synchronization, Mutual Exclusion, Concurrency control, Multiple copy update, Error recovery; and
5. Dependability Evaluation: need and level of requirement, Dependability over system's lifetime from users' point of view, Evaluation matrices, and Fault modelling.

**Remark:**

As of now, we have an ever increasing dependence on computing systems. The course is the need of the hour and interesting. This time sixty students attended the course. The students enjoyed and appreciated the course. Prof. Nanya has good command over English language and this helps students in understanding the subject.

Some pictures taken on February 11, 2016 during the class:



