TRAINING COURSES FOR ANTENNAS AND PROPAGATION DESIGNERS IN IEICE JAPAN

Yoshio Karasawa[1] and Makoto Ando[2]

[1]Department of Electronic Engineering, The University of Electro-Communications, 1-5-1 Chofugaoka, Chofu-shi, Tokyo 182-8585, Japan : karasawa@ee.uec.ac.jp

[2]S3-19, Department of Electrical and electronic Eng., Tokyo Institute of Technology, 2-12-1, Oookayama, Meguro, Tokyo 152-8552, Japan : mando@antenna.ee.titech.ac.jp

ABSTRACT

EM related education is not easy task for both universities and companies. Technical group of Antennas and Propagation in Communication Society of IEICE Japan (TG-AP) opened a series of the training course specially designed for younger engineers as well as seniors who newly join in this heavy topic area. It covers basic EM theory, Numerical method, Antenna design, Propagation and algorithms for wireless communications. It has been working more than 10 years and about 40 courses with total number of about 3000 engineers have been held. This activity will be surveyed in the talk.

HISTORY OF THE COURSES FOR ANTENNAS AND PROPAGATION DESIGNERS

As the basic feature, the course consists of advance homework, one-day lecture and some times associated with technical demonstration. The history of the course is summarized in Table 1. Key features are summarized below.

Steering Committee: About ten members form the standing committee under Technical Group on Antennas and Propagation in Communication Society of IEICE.

Target participants of the course: Young and beginners engineers in the company working in the field of Antennas, Propagation, wireless communications and EM Theory. Graduate course students in EM and AP related topics are another important target. In recent courses, each has about 70 to 130 participants and 20% to 40% of it is from the university. Some of the senior engineers who are changing their speciality into AP and EM, attend the course with the latest topics, as the recurrent education.

Lecturers: A few top engineers are selected every year by the standing committee as well as the requests on the questionnaire. He makes a self-study text book, attend the one-day committee meeting twice before the lecture.

Preparatory staff meeting: Two one-day committee meetings are held for editing the contents of the text

book and for rehearsal of the presentation. Lecturer normally has to attend three one-day meetings in total.

Advance homework: The self-study textbook of more than 100 pages is provided to each participant about one month before the course. The lecturer assumes that every participant has read it and experienced the algorithm/exercise in the text. Usually, participants bring many questions in the lecture.

Fees: This is an activity of the technical group of Antennas and Propagation of IEICE for membership-raising. So, the fees are much cheaper than the commercial seminars outside. After the Kick-off period, fee is further reduced and is about 100-120 USD and 30 USD for the regular and the student respectively.

Copyright: Authors keep the copyright of the TEXT book. So, the text book is available only for the attendees and can not be purchased afterward.

Table 1 History of the workshop.

No	Title	Lecturer	Date	Venue	Organizer	Fee Regular/Student	Attendee
1	Antenna Analysis by Method of Moment -Beginners	H. Nakano	24/11/1994	Tokyo Inst. Tech.	TG.AP	15000/5000	70
2	Antenna Analysis by Method of Moment -Beginners	H. Nakano	31/3/1995	Fukuoka Inst. Tech	TG.AP	15000/5000	70
3	Time Domain Analysis of EM Fields - Beginners	N. Yoshida	12/6/1995	Tokyo Inst. Tech.	TG.AP	15000/5000	80
4	Time Domain Analysis of EM Fields - Beginners	N. Yoshida	7/7/1995	Tokyo Inst. Tech.	TG.AP	15000/5000	85
5	Propagation Analysis and Measurement for Mobile Communication -Beginners	T. Takeuchi	1/12/1995	Tokyo Inst. Tech.	TG.AP	15000/5000	88
6	EM Fields and Antenna Analysis by FDTD -Intermediate	T. Uno	27/3/1996	Tokyo Inst. Tech.	TG.AP	15000/5000	80
7	EM Fields and Antenna Analysis by FDTD -Intermediate	T. Uno	17/9/1996	Kanazawa Univ.	TG.AP	15000/5000	69
8	High Frequency Diffraction Techniques	M. Ando	28/3/1997	Osaka Univ.	TG.AP	15000/5000	72
9	Adaptive Signal Processing and DOA Estimation -Beginners	N. Kikuma	2/9/1997	Tokyo Inst. Tech.	TG.AP	15000/5000	80
10	Adaptive Signal Processing and DOA Estimation -Beginners	N. Kikuma	30/10/1997	Tokyo Inst. Tech.	TG.AP	15000/5000	80
11	Antenna Analysis by Method of Moment -Intermediate	K. Sawaya	28/9/1998	Kofu	TG.AP	15000/5000	77
12	Antenna Measurements - Fundamentals and Applications	T. Teshirogi	29/3/1999	Tokyo Inst. Tech.	TG.AP	15000/5000	68
13	Antenna Measurements - Fundamentals and Applications	T. Teshirogi	12/4/1999	Tokyo Inst. Tech.	TG.AP	15000/5000	73
14	Wideband Mobile Propagation and Modeling in Multipath Environment	Y. Karasawa	6/9/1999	Tokyo Inst. Tech.	TG.AP	15000/5000	70
15	Wideband Mobile Propagation and Modeling in Multipath Environment	Y. Karasawa	13/10/1999	Tokyo Inst. Tech.	TG.AP	13000/4000	80
16	Antenna Analysis and Practical Design by FDTD	H. Arai	27/3/2000	Hiroshima	TG.AP	13000/4000	106
17	Antenna Analysis and Practical Design by FDTD	H. Arai	28/4/2000	Tokyo Inst. Tech.	TG.AP	13000/4000	
18	Wideband Mobile Propagation and Modeling in Multipath Environment	Y. Karasawa	29/9/2000	Nagoya Inst. Tech	TG.AP	13000/4000	49
R1	Antenna Analysis by Method of Moment -Beginners	H. Nakano	29/11/2000	Tokyo NTT	IEEE AP	10000/3000	62
19	Dyadic Greens Functions in Eigen Function Expansion and Design of Waveguide Slot Arr	J. Hirokawa	27/4/2001	Tokyo Inst. Tech.	TG.AP	13000/4000	63
20	Polarimetric Radars - Beginners	Y. Yamaguchi	17/9/2001	Elect. Commun. Un	TG.AP	13000/4000	64
R2	EM Fields and Antenna Analysis by FDTD -Intermediate	T. Uno	13/11/2001	Tokyo Inst. Tech.	IEEE AP	10000/3000	75
21	Fundamentals of Finite Element Method and Application to EM Analysis	M. Koshiba	26/4/2002	Tokyo Inst. Tech.	TG.AP	13000/4000	77
R3	Adaptive Signal Processing and DOA Estimation -Beginners	N. Kikuma	12/6/2002	Tokyo Inst. Tech.	IEEE AP	10000/3000	77
R4	Adaptive Signal Processing and DOA Estimation -Beginners	N. Kikuma	2/7/2002	Tokyo Inst. Tech.	IEEE AP	10000/3000	77
22	Adaptive Antennas for Mobile Communications - Intermediate	Y. Ogawa	5/9/2002	Tokyo Inst. Tech.	TG.AP	13000/4000	78
23	Adaptive Antennas for Mobile Communications - Intermediate	Y. Ogawa	4/10/2002	Tokyo Inst. Tech.	TG.AP	13000/4000	78
24	Biological Equivalent Phantom and Evaluation of Antennas	K. Ito	16/5/2003	Tokyo Inst. Tech.	TG.AP	13000/3000	78
R5	Antenna Analysis by Method of Moment -Beginners	H. Nakano	11/8/2003	Tokyo Inst. Tech.	IEEE AP	10000/3000	78
R6	Antenna Analysis by Method of Moment -Intermediate	K. Sawaya	12/8/2003	Tokyo Inst. Tech.	IEEE AP	10000/3000	78
25	Microstrip Antennas - Beginners	M. Haneishi	16/4/2004	Tokyo Inst. Tech.	TG.AP	13000/3000	150
R7	Wideband Mobile Propagation and Modeling in Multipath Environment	Y. Karasawa	1/7/2004	Tokyo Inst. Tech.	IEEE AP	10000/3000	128
R7	Adaptive Signal Processing and DOA Estimation -Beginners	N. Kikuma	2/7/2002	Tokyo Inst. Tech.	IEEE AP	10000/3000	
26	Fundamentals of MIMO Systems	T. Ogane	29/11/2004	Tokyo Inst. Tech.	TG.AP	13000/3000	136
27	Fundamentals of MIMO Systems	T. Ogane	17/12/2004	Tokyo Inst. Tech.	TG.AP	13000/3000	129
28	Analysis and Design of Microstrip Antennas	Y. Suzuki	26/5/2005	Tokyo Inst. Tech.	TG.AP	13000/3000	96
R8	Antenna Measurements - Fundamentals and Applications	T. Teshirogi	13/10/2005	Tokyo Inst. Tech.	IEEE AP	10000/3000	78

REPEATABILITY OF THE COURSES

After the statistic analysis of the course, considerable number of basic courses are repeated with suitable interval. This indicates that it is too heavy for the company to establish the specific and regular training course for AP and EM engineering in house, while they have freshmen every year who need the technical background in electromagnetic. To accommodate these requests, IEEE APS Tokyo Chapter joined this

program and operates another series which are the duplicate of the one operated previously by TG-AP. The procedure is much simplified from the original one operated by TG-AP; it dispenses with the preparatory staff meeting. As of today, eight courses out of over 30 ones were held in this category by IEEE APS Tokyo chapter as are indicated in the table.

OTHER OUTPUT

There have been strong demands for purchasing the TEXT of the previous courses. In terms of copyright policy, instead of selling them, TG-AP edited a special issue in Trans. Communication of IEICE, which consists of review papers selected from a series of courses, in Japanese and English.
"Recent Progress in Antenna and Propagation Researches Selected Papers" IEICE Transactions on Communications (Japanese Edition) Vol. J86-B, No.9 (Sept., 2003), IEICE Transactions on Communications, (translated into English) (May, 2005)

CONCLUSIONS

In view of explosion of wave technology in the coming information society in contrast with the world tendency of descent of EM colleagues, "how to feed the next generation in electromagnetic" seems one of the urgent task for URSI. IEICE TG-AP is also sharing this feeling and is finding the way to extend this activity. Some examples are; collaboration with Asia Pacific countries as well as IEEE AP education committee, harmonization with IEEE AP distinguished lecturer program, and also workshops in the EM related symposium ISAP.