Ministry of Education

Pilot Program for Networking and Communication Manpower Training

Project for Electromagnetic Education Promotion Center

- **Project Duration**: Two Years, from April 2012 to March 2014
- **Principal Investigator**: Ruey-Beei Wu, Professor, National Taiwan University
- **Co-Principal Investigator**: Tzyh-Ghuang Ma, Professor, National Taiwan University of Science and Technology; Shyi-Ching Lin, Deputy Group Leader, National Center for High-Performance Computing
- **Chairman of Steering Committee**: Song-Tsuen Peng, Professor, Yuan Ze University
- **Motivation and Goal**:

Electromagnetism has a long history with enormous achievements in both theory and applications and yet remains an important branch of fundamental science and technology, because it is still the basis of many new scientific explorations today. However, the education of electromagnetics requires solid training of physical concepts and mathematical skills that seem to scare away many students. Furthermore, in the age of information explosion, there are so much scientific and technological information published in the literature, the selection of appropriate materials for beginning students becomes an issue. While the demand for electromagnetic-related manpower from the industry is very high, the academic institutions are facing with the difficulty of attracting enough number of students to enter this important area of education.

In order to tackle the problem of manpower needs of industries, the project invites the participation of many well-experienced professors in electromagnetics from the major universities, such as National Taiwan University, National Taiwan University of Science and Technology, National Chiao Tung University, Yuen Ze University, and National Chung Cheng University. The Project also calls upon National Center for High-Performance Computing for collaboration to develop an internet learning platform, including an eLearning system and multimedia contents to facilitate teaching in class room as well as self-learning of students anytime and anywhere. The Project is expected to provide the training for electromagnetic talents through digital teaching materials and to enhance the quality of electromagnetic education.

- **Project Strategy and Planning Direction**:

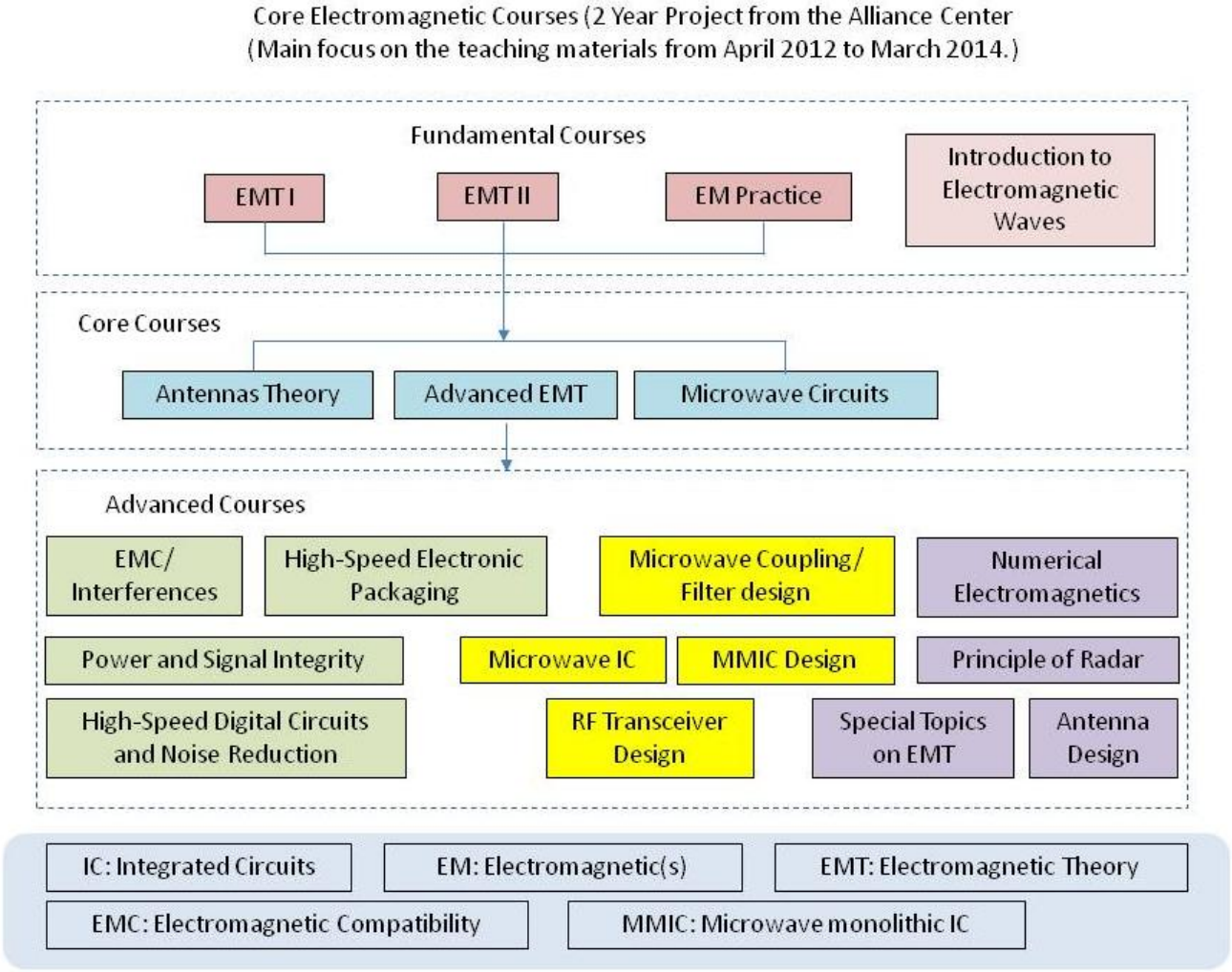
The strategy of the present project adopts the “modular approach”, such that the contents will be in the form of building blocks for flexible design of a course. In this way a teacher is free to choose whatever modules for his class according to the preparedness of his students or his own preference. Also, built in the platform is self-learning system including pre-assessment test to suggest a learning path for each student, and a post-evaluation test to determine how much a student has learned. The instructors from different schools may conduct comprehensive evaluation on student level, number of hours of instruction and

education guidelines to select the most appropriate multimedia teaching materials from each module and to carry out aided teaching and share resources.

The modularized teaching materials of the project are divided into four groups:

1. “Vector Analysis, Maxwell's Equations, and Waveguide”, led by Professor Heng-Tung Hsu, Yuen Ze University
2. “Static Electric and Magnetic Fields, and Plane-Wave Propagation”, led by Professor Ruey Bing Hwang, National Chiao Tung University
3. “Transmission Line theory in Frequency and Time Domains, and Antennas”, led by Professor Tzyh-Ghuang Ma, National Taiwan University of Science and Technology
4. “Electrical Engineering Experiment and Introduction to Electromagnetic System” led by Professor Zuo-Min Tsa, National Chung Cheng University

Upon the completion of the project, a promotion program will be launched so that any interested universities may participate in test-runs on the learning platform. It is hoped that the feedback from teachers and students will contribute to the follow-up improvement of the system.



Roadmap to Learning Career in Electromagnetic Education