

Unconfirmed Minutes of the
IEEE EMC Society Education Committee
Meeting at the IEEE EMCS Symposium
Washington, D.C.
Tuesday, August 22, 2000

1. Call to Order – Introduction
 - 1.1 Chairman Maqsood Mohd started the meeting at 7:00 am. Maqsood thanked everyone for coming.
 - 1.2 Introductions were made of everyone present.
2. Review of Draft Agenda
 - 2.1 No additions or corrections were made to the agenda.
3. Announcements
 - 3.1 Zorica Pantic-Tanner announced that San Francisco State University was recently awarded an NSF grant of \$100,000 to implement EMC concepts throughout their EE curriculum.
 - 3.2 Elya Joffee announced that one of the universities in Israel now has an EMC course. The NW Israel Chapter of the EMC Society is encouraging all universities in Israel to start EMC courses.
4. Minutes of Last Meeting
 - 4.1 The minutes of the August 3, 1999 committee meeting were approved.
5. Old Business
 - 5.1 Brief Subcommittee Reports
 - 5.1.1 Demonstrations

Andy Drozd reported that there are 24 demonstrations this year. He feels that the program this year has been received very well. Andy said the team effort of Larry Cohen, Greg Snyder, Norm Violette and others was very successful. Andy mentioned that there are several new faces this year, and that he has also been busy soliciting experiments for next year. He also welcomes new subcommittee members. If anyone would like to **volunteer** to join

and help prepare for the 2001 Symposium they should contact Andy.

Maqsood asked about the status of formalizing the experiments. Andy explained that the idea of having a formal review process for the experiments was suggested last year. After discussing the idea with several folks, Andy reported that while most thought it was a great idea, some people were concerned that if it is too structured some prospective presenters would decline to participate. Andy is leaning towards such a process, and has a tentative plan and schedule for implementing this. Andy has also been strongly encouraging experiment presenters to write up their lab and submit it to Jim Drewniak for inclusion in the Experiments Manual.

5.1.2 Experiments, Vol. II

Jim Drewniak reported that he and Dick Dubroff are now working on Volume 2 of the Experiments manual. They now have about 6-8 experiments. Volume 1 is available on the web. Jim and Dick have some students helping them put material on the web. Jim mentioned that he will talk to Andy and e-mail all of the people who are giving demonstrations this year to ask them to write up their experiment and submit it.

Dick Dubroff discussed the progress made on Volume 2 of the Manual. Dick talked about the experimental web pages they are now working on, as well as problems that have been addressed regarding incompatibility issues (font incompatibility, not electromagnetic incompatibility!). Dick also reported on a suggested format for future experiments. Copies of Dick's transparencies are included as Attachment I.

5.1.3 NARTE

Jim Whalen reported that the tutorial on Monday had 55-60 attendees, which seems to be a rather "steady state" number. The exam will be given on Friday. Jim has already made contact with the 2001 Workshop Chair to begin advance planning.

Jim was asked to comment about a "Memorandum of Understanding" between NARTE and the IEEE EMC Society, and how it will impact the Education Committee. It was reported that the relationship with the Education Committee will remain about the same as it is now. The responsibility of the technical committees will change. Also, the focus of responsibility for making up test questions will shift from NARTE to the IEEE.

Dick Ford mentioned that he had received a letter from NARTE asking him to review questions. Others had received similar letters. It was pointed out that NARTE has always solicited volunteers for this purpose – not just because of what has happened recently. Maqsood pointed out the need for competent people to review questions and answers. Any **volunteers** should contact Maqsood.

5.1.4 Tutorials

Maqsood reported that the Tutorial sessions went very well yesterday. We had good speakers, a good turn out, and good comments. The only negative aspect was that the snacks were not there for breaks. He looks forward to Montreal!

5.1.5 EMC Outreach

Maqsood reported that functions previously carried out by separate subcommittees (Life Long Learning, etc.) have been combined under the umbrella of “EMC Outreach”. This includes EMC outreach to (1) High School students and faculty, (2) College and university students and faculty, and (3) professionals.

Gregg Kervill reported on one aspect of this work – that of distance learning. Gregg provided us with several statistics (see Attachment 2) about the growing use of the internet for education and training purposes. Gregg mentioned that his company has done considerable research in this area, and has put together a platform that can be used for training purposes in the area of product safety. Gregg suggested that the IEEE has an immediate opportunity to take a leadership role in the development of such material. Anyone interested in should talk to Gregg.

5.1.6 University Grant

John Howard was pleased to report that the subcommittee is doing very well, and has received several very excellent proposals. The winner of this year’s grant is the University of L’Aquila, L’Aquila Italy.

As a follow-up to the proposals that have been funded in previous years, we had reports from the three universities who have received awards.

Kimball Williams reported on the grant received by Northern Illinois University (see Attachment 3.1). Northern Illinois received

the EMC grant in 1997. Dr. Vince McGinn developed an EMC course, which was offered one year later. The course has been very successful, and has run each year since. Professor McGinn reports that as a result of the grant award, he has had opportunity to “spread the word” about EMC to two other universities who are now open to including EMC.

John Howard reported on the grant received by the University of Nevada, Reno (see Attachment 3.2). Professor Bruce Johnson relayed that the grant was instrumental in establishing a regularly taught course in EMC, and in developing projects to be used as extended homework assignments and as a stand alone laboratory for students interested in additional credit. The report written by Professor Johnson highlights all of the things accomplished as a result of the grant.

The 1999 grant was awarded to the University of Michigan – Dearborn, with the work being directed by Professor M. Shridhar. UM-Dearborn has developed a unique program, which has included significant industrial participation. Mark Steffka and Jim Muccioli are two of the folks that have been intricately involved in the program, and they provided the report on the activities at the University of Michigan – Dearborn (see Attachment 3.3). Jim said that he received a very warm reception from the students at Dearborn when he discussed the field of EMC in some of their courses. Jim included demonstrations also and reports that the students are very interested in the area. Mark has also talked with various students about EMC. In addition, he will be serving as an Adjunct Professor at UM - Dearborn, and will be teaching the first EMC course this year. He is really looking forward to the experience, and will be glad to report next year on how it went.

5.1.7 University Survey

Antonio Orlandi reported on the status of the university survey. The survey has been posted on the Web for almost two years now, and as of July 15, 47 universities have responded. This is up from 33 last year. In the survey results (see Attachment 4) Antonio included a geographical listing of where the universities are located, as well as information about the types of courses that are offered (undergraduate vs. graduate), whether laboratory experiments are included, how many students are in the course, etc. Antonio reported that the survey also asks whether the respondent is aware of the existence of the EMC Education Manual (in addition to asking if the Manual is used).

Maqsood asked whether Antonio thought the instructors of the various courses would be willing to share their experiments with the Education Committee. Antonio didn't know, but said we could certainly advertise, requesting this. He will try to place regular ads in the IEEE EMC Transactions as well as the EMC Society Newsletter asking people to submit their experiment write-up to Jim Drewniak and Dick DuBroff.

John Howard and Maqsood asked if Antonio would be willing to help "spread the word" about the EMC Grant, as well as the Student Paper Contest and Student Design Contest to universities outside the United States. Antonio said he would do his best.

5.1.8 Video Productions

Dick Ford reported that he has finished producing a video tape that includes footage from the 1999 Symposium. This includes segments of various experiment/demo presenters (like Clayton Paul). More footage will also be taken this week. Dick mentioned that consideration is still being given to which format(s) we want to use for our productions. Dick also reported that Don Sweeney of D.L.S Electronic Systems donated approximately \$3000 of video editing time. Dick said that Don used his lab, his video editing equipment and his people to create the video. A hearty "thank you" was given to Don.

Hugh Denny pointed out that the IEEE put together a video course on EMC in 1992. Hugh suggested that perhaps some of the material in those videos would be useful to us, as it has good examples of what EMC is all about.

5.1.9 Student Activities

Mike Bogusz was not able to attend the symposium this year, so Bob Nelson gave a brief report, which is included in Attachment 5. Bob reported that Mike feels the need to step down from this position, and that an election for a replacement will be taken this morning. Discussion ensued about some of the issues relating to the copyright and loan policies for the videos. It was pointed out that this is one of the points the new Chair will need to address.

5.1.10 Nominations

As Chair of the Nominations Subcommittee, Bob Nelson reported that Ahmad Fallah has been nominated to replace Mike Bogusz as

Chair of the Student Activities subcommittee. Bob asked if there were any other nominations from the floor. Hearing none, he moved that Ahmad Fallah be the new Student Activities Chair. The motion was approved.

5.1.11 Student Design Contest

Maqsood and Ahmad Fallah reported on this years Student Design Contest. Sixteen kits were requested, including one from Brazil. Of the sixteen, seven kits were submitted for consideration. One kit was disqualified, which left six kits in competition. Three of those kits had components that had broken in transit and needed to be repaired. The final testing was done in a GTEM cell at Phoenix International in Fargo, ND. Maqsood came to Fargo, and joined Ahmad Fallah and another Phoenix employee who was helping with the measurements. It was reported that all of the units were tested in the same manner, and that pictures were taken of all the measurement set-ups. A three-fold criteria was used: (1) the level of radiated emissions, (2) the cost of any extra components that were added (there was no cost for using the components that came with the kit), and (3) the quality of the report, which included a description of what was done to mitigate the emissions, as well as an explanation of the rationale for why this was done. Maqsood pointed out that the measurements were taken over the frequency range of 14 kHz to 100 MHz. This range was broken into several smaller bands when the measurements were done. Maqsood said that all of the entries were very good, and that the emissions were quite close from all of the entries. The final decision came down to considerations based mainly on cost and the quality of report. Based on this criteria, the team of Bryan Stern and Ben Herberg from North Dakota State University were the winners.

Maqsood led the committee in thanking Ahmad Fallah for all that he did to facilitate this contest. Maqsood said that the contest would not have happened without Ahmad's help. He not only came up with the kit design and contest announcement, but his company provided most of the parts for the kits, and also provided the GTEM cell for measurements. He said that an article about the contest will be included in a future EMC Society Newsletter.

When asked what schools were included, it was noted that University of Missouri – Rolla, University of Kentucky, USC – Los Angeles, University of Tennessee at Knoxville, Morgan State University – Baltimore, Michigan State University, North Dakota State University, Rose-Hulman Institute of Technology, Escola de

Engenharia Maua – Instituto Maua de Tecnologia, Brazil participated in the competition.

Dick Ford said he is very pleased to see all of the excitement and synergism being created by the student involvement. He said that student registration is 4-5 times higher than was previously typical. He said the D.C. Committee made a major effort and commitment to facilitate the student involvement, and it is paying off. He volunteered to work with Ahmad and Maqsood in the future to help in any way possible. Clayton Paul joined Dick in appreciation for the student involvement. Clayton also mentioned that he seems to recall that in the past the EMC Symposium had the policy of providing students with free admission. Perhaps we should see if this can be implemented again. Greg Kervill suggested that it would be appropriate to have the winners of the Contest display their design at the Symposium. Maqsood and Ahmad reported that this was the intention, but that too many complications arose this year. In the future, a poster session may be held where all of the students can display their circuits and report.

5.1.12 Website Activity

Maqsood reported that he has recently been bombarded with the need for information from our committee, and has been duly impressed with the need for us to have lots of information readily available to anyone via our website. He reported that Andy Drozd and Bob Nelson have agreed to work on this area. Andy then gave an update of the current status. We currently have a “static” site that is complete and available to anyone. This site includes things like the officers, committee chairs, and a little about our Mission, Vision, Goals, etc., as well as an invitation to join. Andy said that a more dynamic or robust site is currently under development which will include links to many interesting sites, and will be more interactive with the user. The basic idea is that Andy will help Bob get the website in pretty good shape, and then Bob will (try to) maintain it. The webpage address is: <http://www.ewh.ieee.org/soc/emcs/emcsedu.html> and can be accessed via links from the EMC Society webpage

It was pointed out that we want to do a good job with this activity so that our website looks nice, and is very helpful. We may want to consider requesting funds from the Board to pay people to help us, if need be.

5.2 Student Paper Contest

Maqsood said that this year's contest went very well. We had 13 papers submitted (compared to 17 or 18 last year). He said the review process was the same as the previous year: he recruited two unbiased people to assist him in evaluating the papers. With the three evaluators, there was one from academia, one from a lab environment, and one from industry. They used the same guidelines as were used to review any other paper. He reported that the papers were very good quality and that the whole activity went very well.

Maqsood said that he would like us to have both the Student Paper Contest and Student Design Contest next year. It was pointed out that the new Chair of Student Activities will help coordinate these activities.

5.3 Other Old Business

Hugh Denny is the Chair of the Standards and Training Committee (SET Com), and reported that they are in charge of two activities that we might be interested in. Hugh said that during this year's Symposium, SET Com conducted a workshop for the Chairs of various working groups to help them understand the whole process of developing, coordinating, and supporting IEEE EMC standards. He said that the group of 35 that attended yesterday felt it was well worth their time. He hopes to advertise a bit more before next year's Symposium so that more people are aware of the opportunity. Hugh said that the second primary activity of SET Com was to help people know what the IEEE EMC standards are, and what they are for. They try to enhance the awareness of IEEE EMC standards throughout the EMC community and demonstrate how these standards can be effectively applied to the development, production and use of equipment and systems. This activity is being pursued via articles in the IEEE EMC Newsletter.

Maqsood thanked Hugh for the information, and requested that he keep us informed on these matters. Maqsood also encouraged people to consider **volunteering** to help Hugh with these important tasks.

6. New Business

6.1 Modeling and Simulation Demos

Andy Drozd reminded us that last year he briefly discussed his desire to have a Modeling and Simulation Experiments Session, which would be quite similar to our current Demonstrations Session. Andy said that this new event will be launched at the 2001 Symposium in Montreal. There are several avenues that may be pursued in this activity. Andy said that one possibility he likes is to have "regular" experiments accompanied by

computer simulations running at the same time. Although all of the details have not been worked out, Andy stressed that the sessions will emphasize the physics and theory behind the simulation, and not just “glitzy” programs alone. He would like to focus initially on standard, canonical problems. He also stressed that they will need to be careful to leave out the commercial aspects of this. He envisions focusing on code development in university or government settings rather than opening it up to companies. Andy has done quite a bit of background work on this, but sees the need for much more. Maqsood congratulated Andy for his efforts, and encouraged us to go ahead with this interesting endeavor.

6.2 Parity in Student Contests

Maqsood said that he would like to discuss the award values given for the Student Paper Contest and Student Design Contest, with hopes that we can bring them into parity. The winner(s) of the Paper Contest are awarded a cash prize of \$900, plus travel expenses (including Symposium registration) of up to \$2100. This is the first year we have had the Design Contest, so we have not officially announced an award value. However, an award of \$500 has been suggested, along with some travel reimbursement. Maqsood would like to see us have the same award values for both contests.

Several people agreed with him. Bill Croissant thought that we should have at least as much for the Design Contest, if not more. Bill said that many of the entries in the Paper contest are the result of student research for a thesis. Although this is wonderful, he pointed out efforts put forth by students for the Design Contest are most likely solely for the Contest. As such, he felt they should be rewarded at least as well, if not more. He also pointed out that the Design entries may be extremely involved, and use all sorts of “EMC theory and practice”, whereas entries in the Paper Contest may be quite narrow. Clayton agreed with many of Bill’s points, and thought that the awards should be at least equal.

Kimball pointed out that any change in the awards needs to be cleared by the Awards Committee. Warren Kesselman said that we need to make sure the Design Contest has been officially approved by the appropriate body.

After further discussion, it was agreed that from now on, we will have the same awards.

6.3 Succession Plan

Kimball asked that each officer work on recruiting an assistant for their position. Kimball said that the assistant can help out with the workload,

and will also be trained and ready to take over whenever a change is needed. We will then avoid large start-up times in the event of an unexpected change.

7. Adjourn

The meeting adjourned at approximately 9:00 a.m.

Respectfully submitted,

Bob Nelson, Secretary

ATTACHMENT 1

EMC Experiments Vol. II

- Experiment Web Page:
<http://www.umn.edu/~guangy/new>
 - One experiment listed
 - Several more experiments ready to be edited and posted
- Recommendations for Future Submission of Experiments
 - Standard Format
 - Adobe Acrobat PDF files
- Incompatibility Issues (font compatibility, not electromagnetic compatibility)
 - Acrobat 4.0 seems better than earlier versions
 - Math Type Equations/Word Documents
 - Install Math Type Font Set (Action by Reader)?
 - Embed Math Type Fonts in Document (Action by Author)?
 - See Web Page
<http://www.mathtype.com/support/allnotes.stm>
And Select Technical Note 50 (Sharing Documents Containing MathType Equations)

Format for Lab Experiments

Title of the Experiment

Authors & Affiliations

1. OBJECTIVE

Provide a brief description of the experiment's purpose and/or methods.

2. EQUIPMENT

- List any special equipment and/or fixtures, connectors, etc.
- Please include specific manufacturers and model numbers of instruments where appropriate but also provide general specifications that may allow others to duplicate the experiment with alternative instrumentation.

3. PROCEDURE

Provide a concise yet sufficiently complete description of the experimental procedure, assuming that the experimenter is familiar with the operation of the equipment listed in item 2.

4. THEORY & DISCUSSION

This section relates the procedure described section 3 to the objectives stated in section 1. If a suitable description of the theory can be found in a textbook or article, please just provide a short summary and provide a reference to the article or textbook for more details.

5. SUMMARY AND CONCLUSIONS

Limitations of the experimental measurements; modifications or possible extensions of the experiment; and troubleshooting information can all be included in this section.

6. REFERENCES

Please provide bibliographic citations for any references cited in the experiment.

7. APPENDICES

Detailed drawings of special equipment, fixtures, etc. can be included here. Also sample data can be included here.

Attachment 2

Distance Learning

Report to Education Committee – Gregg Kervill

Statistics

The US Department of Commerce "Digital Economy 2000" report states that:-

- <20% of US Manufacturers use internet (INET) for business or Training
- last year, for the first time, US plus Canada represented <50% of INET users
- number of INET users is expected to quadruple each year for the next five years

Additional Research

Eurolink Ltd has undertaken primary research that concludes: Distance Learning is the ONLY cost effective and timely, long term future training media.

Opportunity

IEEE has an immediate opportunity to take a leadership role in developing media.

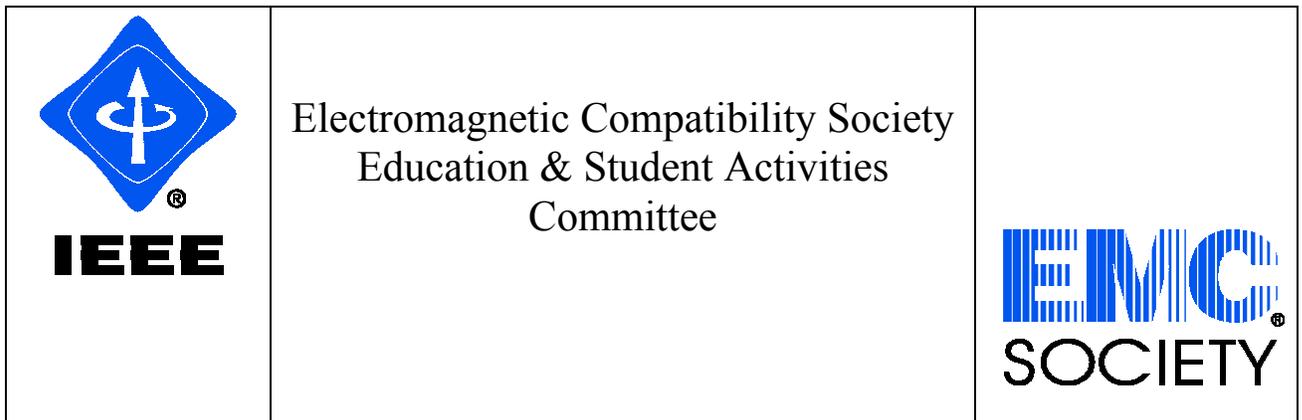
Distance Learning Platform Available

Eurolink Ltd has developed www.test4safety.com as a platform for all creditable and quality regulatory training courses in this emergent media.

Courses in Development

Currently several training modules are being developed and will be available on www.test4safety.com any member wishing to be advised when these are available should email gregg~test4safety.com

ATTACHMENT 3.1



University Grant Committee Re: Northern Illinois University

August 22, 2000

Washington Hilton & Towers - Washington DC

Northern Illinois University Activity:

- Grant issued 1997 to Dr. Vince McGinn
- Course -Senior/Graduate Level
- Fall '99 Term Report: 9 Students -8 Regular, 1 Audit
- Clayton Paul's text.
- Experiments/Demos used
- Noted elements overlooked by many engineers at the start of class were:
 1. Line matching,
 2. Shielding,
 3. Fast clock waveforms,
 4. Power supply quality and design, and
 5. Parasitic behavior of off-the-shelf electrical components.
- Dr. McGinn added the following note

"The grant also allowed me to visit Stevens Institute of Technology in Hoboken NJ and deliver to the EE Dept Chair (Dr. Stuart Tewksbury) a quick overhead presentation suitable for garnering EMC awareness.

This was done 29 Oct 1999. Also, this Spring I will be up at Western New England College in Springfield MA for a day to deliver a similar presentation to their EE students."

Talk to you soon. All the best,

Vince

ATTACHMENT 3.2

Report on the 1999 EMC Education Committee Grant to the University of Nevada, Reno

The \$7,000 grant to the University of Nevada, Reno was instrumental in establishing a regularly taught course in electromagnetic compatibility and in developing projects to be used as extended homework assignments and as a stand alone laboratory for students interested in additional credit and specialization in EMC. Specific items accomplished because of the grant include the following:

1. A course in Electromagnetic Compatibility is now a regularly taught senior/graduate elective in the Electrical Engineering Department (EE 453/653). It was previously taught on a very irregular basis as a seminar class. Students can now use EE 453/653 as an elective to satisfy technical elective requirements in either electromagnetic fields or in electronics. It is offered every spring semester and was taught for the first time as a regular elective in spring, 2000. We have also used the course to invite guest lecturers. These have included John Howard, an EMC consultant who addressed practical EMC debugging, Jerry Remy of ARC Technical Resources who discussed EMC standards, and Bill Wells of International Game Technology who covered practical electrostatic discharge problems.
2. We developed a laboratory experiment in cross-talk based on material covered in Clayton Paul's book on EMC. We built a printed circuit board that could be terminated with different loads and the cross-talk measured on a vector network analyzer and compared with the results reported by Paul. This past spring, one of the graduate students in the class performed the experiment and made a class presentation on the results.
3. Because we have a 15 by 30 foot antenna anechoic chamber with a 15 by 15 foot instrumentation annex, we have developed demonstrations where we teach the students how to use EMC software for both radiated and conducted emissions. They get to mount both the log periodic and the biconical antennas and use the line impedance stabilization network for the conducted emissions. We were able to obtain the donation of a piece of equipment from a local company who had severe EMC problems with their equipment while making measurements in our chamber.
4. We developed six experiments based on the EMC education manual. We tried about eight of the experiments and selected six that seemed to work the best. We then developed black boxes and appropriate circuits necessary to perform the experiments. Students can now perform the experiments on an independent study basis by checking out the required apparatus, reading the EMC education manual, performing the experiment and then reading the report developed by the student who debugged the experiment. I also use these for students who request extra work to partially offset poor exam performance.
5. We were able to video tape the semester long EMC seminar class team taught by Randy Haupt and Bruce Johnson and have developed a library of tapes. These can be checked out by students when they can not make a class because of work commitments (e.g., required travel).

Dr. Bruce Johnson, Professor
Electrical Engineering Department (260)
University of Nevada, Reno

ATTACHMENT 3.3

EMC Education at the *University of Michigan – Dearborn*

“A Status Report”

Presented to *IEEE* by:

James Muccioli

Senior Vice-President, *X2Y Attenuators, L.L.C*
And Adjunct Lecturer,
College of Engineering and Computer Science,
University of Michigan-Dearborn

Mark Steffka

EMC Technical Specialist, *General Motors Powertrain*
and Adjunct Lecturer,
College of Engineering and Computer Science,
University of Michigan-Dearborn

Overview:

EMC curriculum established by Dr. M. Shridhar, Chair of the Electrical and Computer Engineering department

- University realized need for EMC content in engineering curriculum
- Goal was to provide EMC education with support from industry

Accomplishments

The university received a grant from *IEEE*, initiated *IEEE* Guest Lectures, and established curriculum courses

- **Lectures conducted to develop interest in EMC**
- **Sessions covered EMC overview, standards, and professional organizations**

EMC courses in the engineering curriculum consist of undergraduate and graduate level

- *Undergraduate:*
 - ECE 319 – “Electromagnetic Compatibility: An Introduction” (using textbook by Henry Ott)
 - ECE 420 “EMC Measurement and Testing” (using textbook by Clayton Paul)
- *Graduate:* ECE 521 “Special Topics in EMC”

Future Plans

- Dr. Shridhar to complete formal report on EMC education and submit to *IEEE*
- *IEEE* Guest Lectures to be continued in Fall, 2000
- Establishment of EMC testing facilities on campus by working with industry for support and seeking grants for funding

Summary

- *IEEE* has provided funding in support of an EMC curriculum at the *University of Michigan-Dearborn*
- The university established EMC courses
- Industry has supported the university by local EMC professionals as guest and course lecturers

ATTACHMENT 4



Education
Committee



**University
Survey**

**SECOND
YEAR
RESULTS**

The Education Committee of the IEEE Electromagnetic Compatibility Society has started a Survey of the EMC Courses offered in the Universities through out the world. University Instructors of EMC courses are invited to fill out the on-line questionnaire at the following URL:

<http://dau.ing.univaq.it/art>

"EMC" UNIVERSITIES :

USA & CANADA		9+1	10
EUROPE	Belgium	1	
	Bulgaria	1	
	Czech Republic	1	
	Denmark	2	
	England	1	
	Germany	2	
	Italy	6	
	The Netherlands	2	
	Romania	1	
	Russia	3	
	Scotland	1	
	Spain	2	
	Turkey	2	
			25
ASIA	Hong Kong	1	
	Japan	2	
	Malaysia	1	
	Republic of China	2	
	Singapore	1	
	Taiwan	1	
	Thailand	1	
			9
AUSTRALIA			1
SOUTH AMERICA	Brazil		2
		TOTAL	47

TOTAL COURSES OFFERED:

54

"EMC" COURSES:

TOTAL COURSES OFFERED:

54

39% Core

61 % Elective

43% Bachelor, Diploma
43% Master, Laurea
14% Ph. D. and other

Number of Students:

Students ≤ 20	$20 < \text{Students} \leq 100$	Students ≥ 100
56%	33%	11%

Total number of Students:

1867

TOTAL COURSES OFFERED:

54

Total hours of lectures

h < 20	20 < h < 60	60 < h < 100	h > 100
20%	54%	15%	11%

**Hours of Laboratory Experiments and
Computer Simulations**

	h < 1/3 of the total hours of lectures	1/3 < h ≤ 1/2 of the total hours of lectures
Laboratory Experiments	70%	30%
Computer Simulations	87%	13%

**22% OF THE COURSES DO NOT HAVE ANY
LABORATORY EXPERIMENTS**

**46% OF THE COURSES DO NOT USE ANY
COMPUTER SIMULATION**

TOTAL COURSES OFFERED:

54

Use of the IEEE EMC EDUCATION MANUAL

NO	PARTIALLY	YES
54%	37%	9%

Texts

Published Books	Instructor's notes
50%	50%

WE HAVE:

- dynamically updated data-base with:
 - full addresses of EMC Instructors
 - complete information on the EMC courses

WE NEED:

- to extend more and more the invitation to fill in the questionnaire

Any suggestion for the questionnaire is welcome !!!

ATTACHMENT 5

This report summarizes the activities of the Student Activities Subcommittee as of 17 August 2000.

1 Student Design Competition

This activity is guided by Dr. William (Bill) Croisant. The Student Activities Subcommittee is providing support to Bill on an as requested basis.

2. Student Paper Contest

A Call for Student Papers appeared in the generic Call for Papers that was distributed in the package of handouts that each attendee received at the 1999 EMC symposium in Seattle. This call requested papers for the 2000 EMC symposium in Washington, DC. This call was initiated by the 2000 EMC symposium's technical committee.

The recommendations that appeared in the report dated 29 July 1999 remain unchanged and are listed below.

Recommendations:

- a. The Call for Student Papers should regularly appear in the package of handouts that each attendee receives at the annual IEEE EMC symposium.**
- b. The Call for Student Papers should published on the EMC Society's website.**
- c. Perhaps the effort to compile a list of academic contacts that could be approached directly for papers should be rekindled.**
- d. Please see remark about majordomo e-mail list under section 4 of this report.**
- e. Other suggestions on how to publicize this award more widely are invited.**

3. President's Award

The recommendations that appeared in the report dated 29 July 1999 remain unchanged and are listed below.

Recommendations:

- a. This advertisement should regularly appear in every EMC Society Newsletter.**
- b. Please see remark about majordomo e-mail list under section 4 of this report.**
- c. Other suggestions on how to publicize this award more widely are invited.**

4. Outreach to Students and Student Branches

I contacted Dr. Edward Nowicki of the University of Calgary, who teaches a third-year undergraduate electromagnetics course and who advises a number of graduate electrical engineering students. He allowed me to present a one and one-half hour talk on Thursday, 7 October 1999, on electromagnetic compatibility during his morning lecture time. An audience of approximately 80 people, primarily third-year undergraduate electrical engineering students, attended the talk. The content was a little too technical for the audience, although Dr. Nowicki was positive and received some positive feedback on the talk. The slide presentation is available in MS Word format.

On another front, presentation materials in the form of projector slides were forwarded to Dick Ford. Dick agreed to convert these slides into electronic form, such as Microsoft Power Point.

The recommendations that appeared in the report dated 16 November 1999 remain unchanged and are listed below.

Recommendations:

- a. **Follow up with Dick Ford to determine how he has progressed on converting the presentation slides into electronic form. Once the conversion is completion, the intention is to post the presentation material on the EMC Society website for wider use.**
- b. **Investigate how the presentation material from my talk at the University of Calgary in October 1999 could be put to wider use.**
- c. **Given the enthusiastic response that I received, I recommend that other committee members approach their local technical universities and vocational colleges whether they would be interested in hearing a talk on electromagnetic compatibility.**
- d. **Assistance with the task of compiling all of these addresses to get the Majordomo list together is requested.**
- e. **Other suggestions on how to improve outreach to student branches are invited.**

5. Videos

The copyright and loan policy issues that were presented in the report dated 29 July 1999 were discussed at the TC-1 EMC Management meeting at the 1999 IEEE EMC Symposium in Seattle, but remain unresolved. The nature of those discussions were documented in the TC-1 meeting minutes and posted on the TC-1 website by the TC-1 committee chairman.

The recommendations that appeared in the report dated 29 July 1999 have been updated to reflect recent progress and are listed below.

Recommendations:

- a. **Discussions on the loan policy to non-IEEE members should initiated by e-mail and consensus should be reached.**
- b. **A strategy session should be convened to discuss how to proceed with all of the activities on the videos.**
- c. **Assistance with the task of following up with ABC on copyright issues with the Connie Chung video is requested.**
- d. **Assistance with the task of following up with the leads that Jim Whalen provided is requested.**
- e. **Other suggestions are invited.**

6. Other

I feel that, because of yet more upheaval recently both in my personal and professional life, I am not in a position to continue as chair of the Student Activities Subcommittee. I am focusing my energy on dealing with particularly distressing issues that have arisen in my personal life.

I think it would then be advisable to take advantage of the upcoming meeting at the Symposium in Washington DC to find my replacement. I will certainly provide every cooperation to facilitate the transition.

Respectfully submitted,

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